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RUBBER

U. S. RUBBER RECLAIMING CO., Inc.

42nd ST. BUILDING, NEW YORK

United States Rubber Company

1790 Broadway
New York

The Largest Rubber Manufacturers in the World

Indexed Buyers' Guide to Rubber Products

Below will be found a list of Rubber Products and the index to the Rubber Companies who manufacture each item, compiled from information furnished by the manufacturers. The key symbols after the names of the articles refer to the names of manufacturers that appear in the Alphabetical List of Rubber Manufacturers that follows this BUYERS' GUIDE. Further information for Buyers will be gladly furnished by The Rubber Age and Tire News

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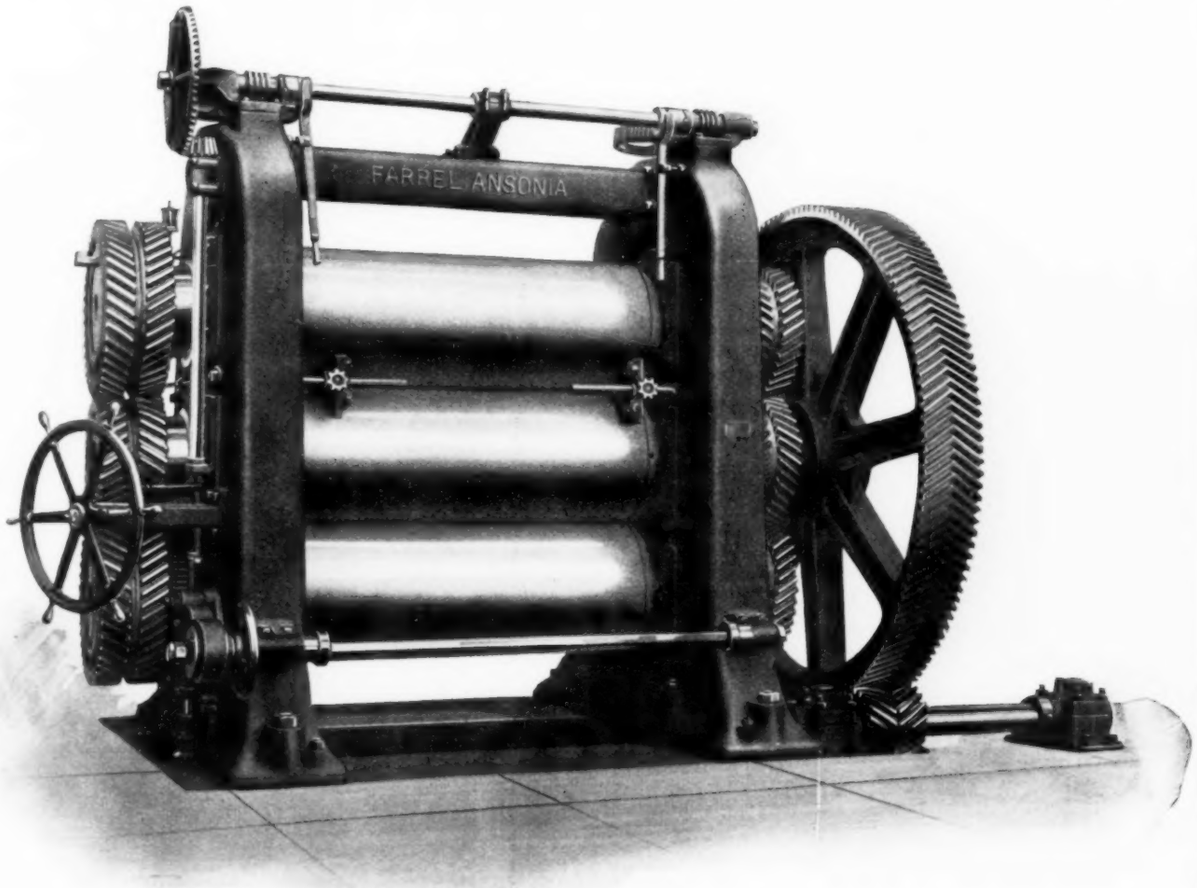
FARREL
Rubber Machinery



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Indexed Buyers' Guide to Rubber Products—Continued

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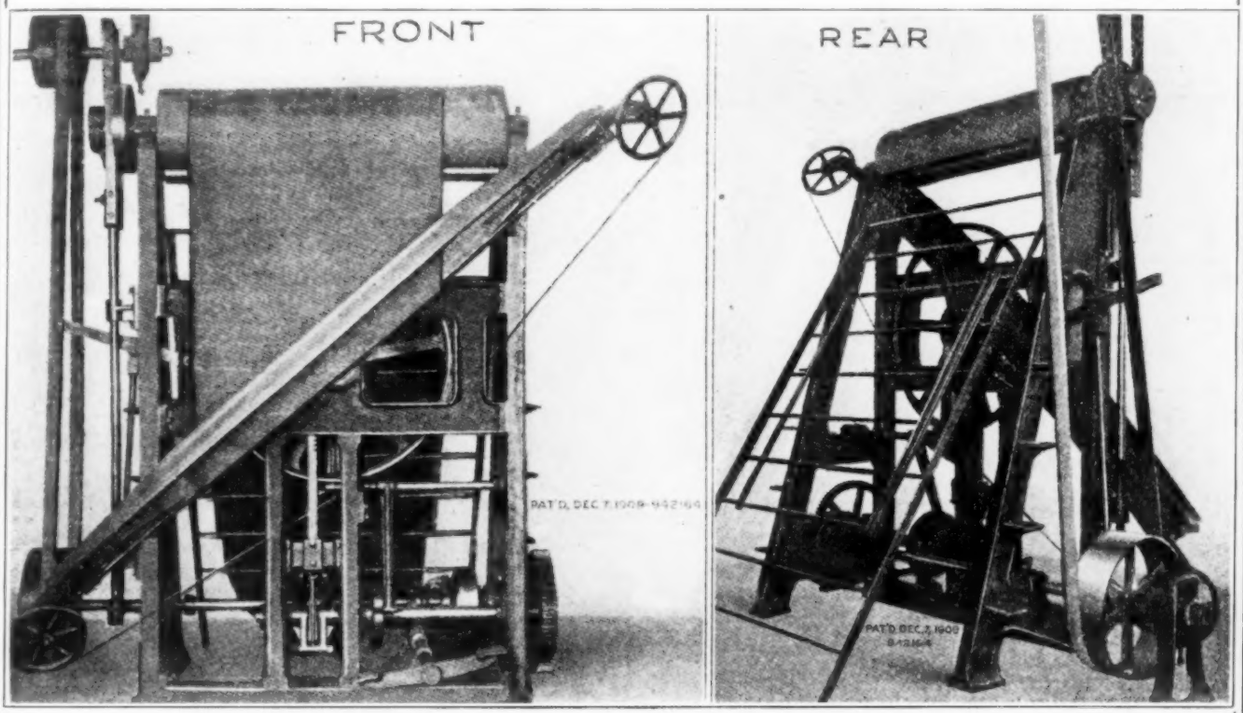

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Jars, Battery, B68.
Mittens, Electricians', C22.
Pliers, Insulated, J10, N42, R42, S68, V22, A34, A33.
Screw Drivers, Insulated, J10, N42, R42, S68, G22.
Sleeves, Electricians', C22.
Splicing Compounds, B22, B50, J10, N28, N42, S2, S68, C6, D33, G22.
Stools, Electricians', C22.
Tape, Electrical, B22, B50, E22, J10, M52, N42, S2, S68, C6, D33.
Wire, Armored, A34, B22, D20, I12, N42, S2, G22, H26.
Wire, Insulated, A4, A3, A34, B22, B52, D20, I12, N42, P36, R26, S2, G22, H26.
Wire, Lead Covered, A34, I12, N42, S2, G22, H26.
Wrappings, Cable Insulated, B50.

Sporting Goods

Bags, Punching, D6, S33, U10, C6, G22, P10.
Balloons, Toy, M89.
Balls, Basket, M89.
Balls, Bat, F14, S33, U10, C6, G22.
Balls, Bowling, B72, B68, A34.
Balls, Foot, H40, S33, U10, C6, G22, M89.
Balls, Golf, S33, S42, U10, D33, G22.
Balls, Hand, U10.
Balls Inflated, F14, S33, U10, C6, G22.
Balls, Play, G46.
Balls, Polo, U10.
Balls, Rubber, D33, G22.
Balls, Solid, E32, F14, S33, U10, C6, G22.
Balls, Tennis, S33, U10, C6, G22.
Bladders, Association Ball, U10, G22.
Bladders, Basket Ball, U10, G22, M89.
Bladders, Football, D6, M66, S33, T16, U10, C6, G22, P10.
Bladders, Punching Bag, M66, G22.
Bladders, Volley, U10.
Centers, Baseball, S33, S50, T16, U10, G22.
Chips, Poker, U10, C6, G22.
Plates, Baseball Home, S33, U10, G22, A33.
Plates, Baseball Pitcher, S33, U10, G22, A33.
Protectors, Baseball Body, H40, M52, S33, T16, N10, G22.
Quoits, Rubber, E22.
Shoes, M89.
Tees, Golf, S50, U10, D33, G22.

Hard Rubber Goods

Automobile Parts, E32, N42, T14, N10, G22, A34.
Barrels, Fountain Pen, U10, G22, A34.
Bits, Pipe, T14, U10, G22, A34.
Caps, Fountain Pen, E32, U10, G22, A34.
Caps, Radiator, U10, G22, A33, A34.
Cases, Thermometer, U10, G22, A34.
Combs, A34.
Covers, Battery, U10, W10, G22, A33, A34.
Discs, Water Meter, S68, U10, G22, A34.
Ebonite, T14, U10, G22, A33, A34.
Electrical Goods, S68, T14, U10, G22, A34.
Feeds, Fountain Pen, U10, G22, A34.
Grips, Pistol, U10, G22, A34.
Handles, U10, G22, A34.
Jars, Battery, B68, N42, U10, W10, G22, A33, A34.
Parts, Battery, U10, G22, A33, A34.
Parts, Internal, U10, G22, A34.
Pipes, T16, U10, G22, A34.
Plates, Gun Butt, U10, G22, A34.
Rods, S68, U10, G22, A33, A34.
Scale, Razor, T14, U10, G22, A34.
Separators, Battery, N42, U10, G22, A34.
Sheet, N42, S68, U10, G22, A33, A34.
Specialties, Industrial, U10, W10, G22, A34.
Spiders, Steering, U10, G22, A34.
Stock, Fountain Pen, U10, G22, A34.
Stocks, Hard Rubber, W22, A34.
Syringe Fittings, D6, F14, H40, T14, T16, U10, G22, A34.
Syringes, T16, U10, G22, A34.
Tubing, H8, U10, G22, A34.
Vents, Battery, U10, G22, A33, A34.

Alphabetical List of Rubber Manufacturers

THE RUBBER AGE AND TIRE NEWS will furnish information and addresses of all companies listed below. Names of advertisers in this issue are printed in heavy face type.

A 2—A. & A. Rubber Co.
A 4—A. A. Wire Co., Inc.
A 5—Achilles Rubber Co.
A 6—Acme Rubber Mfg. Co.
A 8—Acorn Insulated Wire Co.
A 10—Advance Rubber Co.
A 12—Aetna Rubber Co.
A 13—Aiken-Lambert Co.
A 14—Ajax Rubber Co., Inc.
A 16—Akron Rubber Works.
A 18—Akron Tire Co., Inc.
A 20—Alden Rubber Co.
A 22—Allcock Mfg. Co.
A 24—Allen, W. D., Mfg. Co.
A 26—Alliance Rubber Co.
A 28—Amazon Rubber Co.
A 30—American Asbestos Co.
A 32—American Electrical Works.
A 34—American Hard Rubber Co.
A 36—American Lead Pencil Co.
A 38—American Para Rubber Co.
A 40—American Rubber & Tire Co.
A 42—American Rubber Co.
A 44—American Rubber Fabric Co.
A 46—American Rubber Mfg. Co.
A 48—American Rubber Mfg. Co. of N. J.
A 50—American Steam Packing Co.
A 52—American Steel & Wire Co.
A 54—American Tire Co.
A 56—American Tire Co.
A 58—American Wringer Co.
A 60—Anchor Packing Co.
A 62—Anderson, L. M., Co.
A 64—Anderson Rubber Works.
A 65—Apsley Rubber Co.
A 66—Archer Rubber Co.
A 68—Armstrong Rubber Co., Inc.
A 70—Asbestos Fibre Spinning Co.
A 72—Asbestos & Rubber Works of America.
A 74—Asbestos & Rubber Works of New Jersey.
A 76—Asbestos Textile Co., Inc.
A 78—Aseptic Products Co.
A 80—Ash, Claudius, Sons & Co., Ltd.
A 82—Astoria Wire Co.
A 83—Athol Mfg. Co.
A 84—Atlantic Insulated Wire & Cable Co.
A 86—Atlantic Mfg. Co.
A 88—Atlantic Rubber Co.
A 90—Atlas Auto Supply Co.
A 92—Augustine, W. B.
A 94—Avon Sole Co.

B 4—Baltimore Rubber Tire Mfg. Co., Inc.
B 6—Banigan Rubber Co.
B 8—Batavia Rubber Co.
B 10—Bauer & Black.
B 12—Baumann Rubber Co.
B 14—Bay State Insulated Wire & Cable Co.
B 16—Beacon Rubber Mfg. Co.
B 18—Beacon Falls Rubber Shoe Co.
B 20—Behrend & Rothschild.
B 22—Belden Mfg. Co.
B 24—Bell, Andrew, Estate of.
B 26—Belmont Packing & Rubber Co.
B 28—Berlin Rubber Mfg. Co.
B 30—BeSaw Tire & Rubber Co.
B 32—Bergougnan Tire Corp.
B 34—Bishop Gutta Percha Co.
B 36—Blake, Whitney Co.
B 38—Blakesley Novelty Co.
B 39—Boone Tire & Rubber Co.
B 40—Boonton Rubber Mfg. Co.
B 42—Boston Belting Co.
B 44—Boston Blacking Co.
B 46—Boston Insulated Wire & Cable Co.
B 48—Boston Rubber Shoe Co.
B 50—Boston Woven Hose & Rubber Co.
B 52—Bourn Rubber Co.
B 54—Bowers Rubber Works.
B 56—Bowling Green Rubber Co.
B 58—Braender Rubber & Tire Co.
B 60—Braintree Rubber Cement Co.
B 72—Brietson Mfg. Co.
B 62—British-American Mfg. Co.
B 64—Brock, A. S., Rubber Co.
B 66—Brooklyn Shield & Rubber Co.
B 68—Brunswick - Balke - Collender Co.
B 70—Bucyrus Rubber Co.
B 72—Buffalo Weaving & Belting Co.

C 2—C. C. C. Fire Hose Co.
C 3—Cambridge Rubber Co.
C 4—Canada Wire & Cable Co., Ltd.
C 6—Canadian Consolidated Rubber Co., Ltd.
C 8—Canadian General Electric Co., Ltd.
C 10—Canadian Rubber Company of Montreal, Ltd.
C 12—Canadian Top Co., Ltd.
C 14—Cancos Mfg. Co.
C 16—Candee, L., & Co.

C 18—Canfield, H. O., Co. See Advertisement on Page 379.

C 20—Canfield Rubber Co.
C 22—Canton Rubber Co.
C 24—Carborundum Co.
C 25—Carlisle Cord Tire Co.
C 26—Carolina Puncture Proof Tubing Co.
C 28—Carr, F. S., Co.
C 30—Centaur Rubber & Tire Co., Inc.
C 32—Century Rubber Works.
C 34—Chemical Rubber Co.
C 36—Chicago Rubber Clothing Co.
C 38—Cigol, F. A., Rubber Co.
C 40—Cincinnati Rubber Mfg. Co.
C 42—Clark Rubber Mfg. Co.
C 44—Clifton Mfg. Co.
C 46—Collyer Insulated Wire Co.
C 48—Colorado Tire & Leather Co.
C 50—Columbia Tire & Rubber Co.
C 52—Columbus Rubber Co. of Montreal, Ltd.
C 54—Combination Rubber Mfg. Co.
C 56—Community Rubber Co.
C 58—Conklin Pen Mfg. Co.
C 60—Conquerer Rubber Cement Co.
C 62—Consolidated Hoof Pad Co.
C 64—Continental Rubber Works.
C 66—Converse Rubber Shoe Co.
C 68—Cortland Tire & Rubber Co.
C 70—Craig Dental Mfg. Co.
C 72—Crandall Packing Co.
C 74—Crescent Insulated Wire & Cable Co.
C 75—Crown Tire and Rubber Co.
C 76—Cummer-Dowswell, Ltd.
C 78—Cummings, G. R., & Co.
C 80—Cuppies Co.
C 82—Cutten & Foster.

D 2—Davidson Rubber Co.
D 4—Davis-Fry Mfg. Co.
D 6—Davol Rubber Co.
D 8—Day, H. P. & E., Inc.
D 10—Dayton Rubber Mfg. Co.
D 12—Dealers Steam Packing Co.
D 14—Deane Plaster Co.
D 16—Delion Tire & Rubber Co.
D 18—De Silva Rubber Co., Inc.
D 20—Detroit Insulated Wire Co.
D 22—Dick, R. & J., Ltd.
D 24—Dixon, Joseph, Crucible Co.
D 26—Doherty, Eugene, Rubber Works, Inc.
D 28—Dominion Rubber Co., Ltd.
D 30—Dominion Tire Co., Ltd.
D 32—Dreadnaught Tire & Rubber Co.
D 34—Dry Climate Tire Mfg. Co.
D 36—Dryden Rubber Co.
D 38—Dunlop Tire & Rubber Goods Co., Ltd.
D 40—Dural Rubber Corp.

E 2—Eagle Pencil Co.
E 4—Eagle Rubber Co.
E 6—Eagle Rubber Cement Co.
E 8—Eastern Electric Cable Co.
E 10—Eastern Rubber Co.
E 12—Easthampton Rubber Thread Co.
E 14—East Palestine Rubber Co.
E 16—Eclipse Cement & Blacking Co.
E 18—Ehman Tire & Rubber Co.
E 19—Electric Cable Co.
E 20—Electric Hose & Rubber Co.
E 22—Elkhart Rubber Works.
E 24—Ellis Cement Co.
E 26—Empire Rubber & Tire Co.
E 28—Endura Mfg. Co.
E 30—Eudurance Tire & Rubber Co.

E 32—Essex Rubber Co., Inc. See Advertisement on Page 379.

E 34—Eureka Cement Co.
E 36—Eureka Fire Hose Mfg. Co.
E 38—Eureka Packing Co.
E 40—Eureka Rubber Mfg. Co.
E 42—Excello Raincoat Co.

F 2—Faber, A. W.
F 4—Faber, Eberhard, Rubber Co.
F 6—Fabric Fire Hose Co.
F 8—Fairfield Rubber Co.
F 10—Falls Rubber Co.

Alphabetical List of Rubber Manufacturers—Continued

F 12—Falls Novelty Co.
F 14—Faultless Rubber Co.
F 16—Featheredge Rubber Co.
F 18—Federal Asbestos Co.
F 20—Federal Rubber Co.
F 22—Firestone Tire & Rubber Co.
F 24—Fisk, Ltd.
F 26—Fisk Rubber Co. of New York.
F 28—Flexible Rubber Goods Co.
F 30—Ford Motor Co.
F 32—Foster Rubber Co.
F 34—Franche, C. E. Co.
F 36—Franklin Rubber Co.

G 2—G. & J. Tire Co.
G 4—Garlock Packing Co.
G 6—General Asbestos & Rubber Co.
G 8—General Electric Co.
G 10—General Tire & Rubber Co.
G 12—Giant Tire & Rubber Co.
G 14—Gibney Tire & Rubber Co.
G 16—Gillette Rubber Co.
G 18—Globe Rubber Co.
G 20—Globe Rubber Tire Mfg. Co.
G 22—Goodrich Rubber Co., The B. F.
G 24—Goodyear Rubber Co.
G 26—Goodyear Rubber Insulating Co.
G 28—Goodyear Tire & Rubber Co.
G 30—Goodyear Tire & Rubber Co. of Canada, Ltd.
G 32—Goodyear's India Rubber Glove Mfg. Co.
G 33—Goodyear's India Rubber Selling Co.
G 34—Goodyear's Metallic Rubber Shoe Co.
G 36—Gordon Tire & Rubber Co.
G 38—Gould Packing Co.
G 40—Granby Rubber Co., Ltd.
G 42—Great Eastern Rubber Co.
G 44—Greensburg Tire & Rubber Co.
G 46—Gregory Rubber Co.
G 48—Gryphon Tire & Rubber Co.
G 50—Gutta Percha & Rubber, Ltd.
G 52—Gutta Percha & Rubber Mfg. Co.

H 2—Habirshaw Electric Cable Co.
H 4—Hainsburg, N. H. & Co.
H 6—Hale, Alfred Rubber Co.
H 7—Halifax Rubber Co.

H8—Hamilton Rubber Mfg. Co. See Advertisement on Page 377.

H 10—Hanover Rubber Co.
H 12—Hardman Tire & Rubber Co.
H 14—Hartford Rubber Works Co.
H 16—Hardright Co.
H 20—Hatch, Henry C.
H 22—Hauthaway & Sons, Inc.
H 24—Hawkeye Tire and Rubber Co.
H 26—Hazard Mfg. Co.
H 28—Hazen-Brown Co.
H 30—Heath, Edmund F. & Son.
H 32—Hendler, Jesse.
H 34—Hendrie, W. C. Rubber Co.
H 36—Hewitt Rubber Co.

H 40—Hodgman Rubber Co. See Advertisement on Page 377.

H 42—Hollingshead, R. M.
H 44—Holmes Packing & Supply Co.
H 46—Home Rubber Co.
H 48—Hood Rubber Co.
H 50—Hood Tire Co.
H 52—Hosmer, G. A. Co.
H 54—Howe-Baumann Balloon Co.
H 56—Howe Rubber Co.
H 58—Huntington Tire & Rubber Co.
H 60—Hygienic Rubber Works.

I 2—Ideal Rubber Co.
I 4—Imperial Belting Co.
I 6—Independent Rubber Co., Ltd.
I 8—India Rubber Co.
I 10—Indian Rubber Mfg. Co., Inc.
I 12—Indiana Rubber & Insulated Wire Co.
I 14—International Rubber Co.
I 16—International India Rubber Corp.
I 18—Invincible Tire Co.

J 2—Jackson-Eno Rubber Co.
J 4—Jenkins Rubber Co.
J 6—Johnson, Henry Co.
J 8—Johnson & Johnson.
J 10—Johns-Manville, H. W. Co.
J 12—Johns-Pratt Co.

K 2—Kansas City Rubber & Tire Co.
K 3—Kanzee Tire Co., Ltd.
K 4—Kaufman Rubber Co., Ltd.
K 6—Keasbey & Mattison Co.
K 8—Keaton Tire & Rubber Co.
K 10—Kelly-Springfield Tire Co.
K 11—Kendall Tire & Rubber Co.
K 12—Kenyon, C. Co.
K 14—Kerite Insulated Wire & Cable Co.
K 16—Keystone Rubber Mfg. Co., Inc.
K 18—Killion Rubber Co.
K 20—King Rubber Co.
K 22—Kleinert, I. B. Rubber Co.
K 24—Knight Tire & Rubber Co.
K 26—Kokomo Rubber Co.
K 28—Korber Rubber Mfg. Co.

L 2—L. & M. Rubber Co.
L 4—La Crosse Rubber Mills Co.
L 6—La Favorite Rubber Mfg. Co.
L 8—Lambertville Rubber Co.
L 9—Longwear Rubber Co.
L 10—Lancaster Tire & Rubber Co.
L 12—Laurel Company.
L 14—Lee Tire & Rubber Co.
L 16—Lion Tire & Rubber Corp.
L 18—Lincoln Rubber Co.
L 19—Longwear Rubber Co.
L 20—Lovell Mfg. Co.
L 22—Lowell Insulated Wire Co.
L 24—Lubron Co.
L 26—Luzerene Rubber Co.
L 28—Lycoming Rubber Co.
L 30—Lynn Rubber Mfg. Co

M 2—McClurg Rubber Co.
M 4—McCormick, E. J. Rubber Co.
M 6—McCreary Tire & Rubber Co.
M 8—McCue & Pierce.
M 10—McGraw Tire & Rubber Co.
M 12—McIlroy Belting & Hose Co.
M 14—McLean Tire & Rubber Co.
M 16—McNaull Tire Co.
M 18—McTernen Rubber Mfg. Co.
M 20—Maguire Rubber Co.
M 22—Manhattan Rubber Mfg. Co.
M 24—Manheim Mfg. & Belting Co.
M 26—Mansfield Tire & Rubber Co.
M 28—Maple Leaf Rubber Co.
M 30—Marathon Tire & Rubber Co.
M 32—Marathon Tire & Rubber Co., Ltd.
M 34—Marion Insulated Wire & Rubber Co.
M 36—Marion Tire & Rubber Co.
M 38—Mason Tire & Rubber Co.
M 40—Massillon Rubber Co.
M 42—Mattson Rubber Co.
M 44—Mayflower Rubber Works Co.
M 46—Meade Rubber Co.
M 48—Mechanical Fabric Co.
M 50—Mechanical Rubber Co. (Chicago).
M 52—Mechanical Rubber Co. (Cleveland).
M 54—Mercer Rubber Co.
M 56—Merchants' Rubber Co.
M 58—Metal Hose & Tubing Co.
M 62—Meyer Rubber Co.
M 64—Michelin Tire Co.
M 65—Midland Tire & Rubber Co.
M 66—Miller Rubber Co.
M 68—Miner Rubber Co., Ltd.
M 70—Minzensheimer, Dr. Her.
M 72—Mishawaka Woolen Mfg. Co.
M 74—Mohawk Rubber Co.
M 76—Montgomery Bros., Inc.
M 76—Moore, Alfred F.
M 80—Morgan & Wright.
M 82—Mulconroy Company, Inc.
M 84—Mutty, L. J. Co.
M 86—Mutual Tire & Rubber Co.
M 88—Mystic Rubber Corp.

N 2—Narragansett Rubber Co.
N 4—National Aseptic Laboratories.
N 6—National Co.
N 8—National India Rubber Co.
N 10—National Rubber & Specialties Co.
N 12—National Rubber Co.
N 14—National Rubber Mfg. Co.
N 16—National Tire & Rubber Co.
N 18—Needham Tire & Rubber Co.
N 20—Newark Rubber Co.
N 22—New Brunswick Rubber Co.
N 24—New Castle Rubber Co.
N 26—New England Cable Co.
N 28—New Jersey Car Spring & Rubber Co.
N 30—New Jersey Rubber Supply Co.
N 32—New York Belting & Packing Co.
N 34—New York Insulated Wire Co.
N 36—New York Mackintosh Co.
N 38—New York Rubber Co.
N 40—New York Shield Co.
N 42—Northern Electric Co., Ltd.
N 44—Northland Rubber Co., Inc.
N 46—Norwalk Tire & Rubber Co.
O 1—Oak Rubber Co.
O 2—O. K. Tire Co.
O 4—Okonite Co.
O 6—Olden Rubber Mfg. Co.
O 7—Old Town Rubber Co.
O 8—Oliver Rubber Mfg. Co.
O 12—Omo Mfg. Co.
O 13—O'Neil Tire and Rubber Co.
O 14—Oriental Rubber Co.
P 2—Packard Electric Co.
P 4—Panther Rubber Mfg. Co.
P 6—Parker Pen Co.
P 8—Parker, Stearns & Co.
P 10—Partridge, F. E. Rubber Co.
P 12—Pearce-Arrow Tire & Rubber Co.
P 14—Pearce Tire & Rubber Co.
P 16—Peerless Cement Co.
P 18—Peerless Insulated Wire & Cable Co.
P 20—Peerless Rubber Mfg. Co.
P 22—Peerless Tire & Rubber Co.
P 24—Pennsylvania Rubber Co.
P 26—Perfection Tire & Rubber Co.
P 28—Perfection Tube Co.
P 30—Peters Mfg. Co.
P 32—Pharis Tire & Rubber Co.
P 34—Phillips, Eugene F., Electrical Works, Ltd.
P 36—Phillips Insulated Wire Co.
P 38—Phoenix Hermetic Co.
P 40—Pike Rubber Co.
P 42—Pines Rubber Co., Inc.
P 44—Plymouth Rubber Co.
P 46—Polack Tyre & Rubber Co.
P 48—Portage Rubber Co.
P 50—Porter Rubber Co.
P 52—Portland Rubber Mills
P 54—Prenzel, A. H., Rubber Co.
P 56—Progress Rubber Co.
P 58—Progressive Rubber Co.
P 60—Puget Sound Rubber Co.
Q 2—Quabaug Rubber Co.
Q 4—Quaker City Rubber Co.
Q 6—Quality Tire & Rubber Co.
Q 8—Quinn, K. J., & Co.
R 2—Racine Auto Tire Co.
R 4—Racine Rubber Co.
R 6—Rainbow Rubber Co.
R 8—Raley Rubber Co.
R 10—Raymond & Co.
R 12—Reach, A. J., Co.
R 14—Reading Rubber Mfg. Co.
R 16—Reality Rubber Co.
R 18—Republic Rubber Co.
R 20—Revere Rubber Co.
R 22—Roberts Rubber Co., Weldon.
R 24—Roebling's, John A., Sons Co.
R 26—Rome Wire Co.
R 28—Rosenthal & Katz.
R 30—Rosenwald & Weil.
R 32—Royal Equipment Co.
R 34—Royal Rubber Cement Co.
R 36—Royal Rubber Works.
R 38—Rubber & Celluloid Harness Trimming Co.
R 40—Rubber Goods Mfg. Co.
R 42—Rubber Insulated Metals Corp.
R 44—Rubber Products Co.
R 46—Rubberset Co.
R 48—Rubber Step Mfg. Co.
R 50—Rubber Stopple Co.
R 52—Ryan Ideal Stain Blacking Co.
S 2—Safety Insulated Wire & Cable Co.
S 4—Salem Rubber Cement Co.
S 6—Salem Rubber Co.
S 7—Samson Tire & Rubber Co.
S 8—Savage Tire Corp.
S 10—Savoie Rubber Co.
S 12—Schacht Rubber Mfg. Co.
S 14—Schavoir Rubber Co.
S 16—Schaw Cone Tire Co.
S 18—Schein, S., & Sons.
S 20—Schmid-Lyon Rubber Co.
S 22—Schwarzwaelder Co.
S 23—Sciato Rubber Co.
S 24—Seabury & Johnson.

S 26—Seamless Rubber Co. See Advertisement on Page 377.

S 28—Semple Rubber Co.
S 30—Simplex Wire & Cable Co.
S 32—Smith Canvas Tread Tire Co.
S 34—Soltau, Robert, Co.
S 36—Southern Tire & Rubber Co.
S 37—Savoie Rubber Co.
S 38—Spalding, A. G., & Bros.
S 40—St. Louis Rubber Cement Co.
S 42—St. Mungo Mfg. Co. of America
S 44—Standard Four Tire Co.
S 46—Standard Rubber & Cable Co.
S 48—Standard Tire & Rubber Co.
S 50—Standard Tire & Rubber Mfg. Co.
S 52—Standard Underground Cable Co.
S 54—Standard Woven Fabric Co.
S 56—Star Rubber Co.
S 58—Steece, Mortimer.
S 60—Sterling Rubber Co., Ltd.
S 61—Sterling Tire Corp.
S 62—Stokes, Joseph, Rubber Co.
S 64—Stoughton Rubber Co.
S 66—Stowe & Woodward Co.
S 68—Strong Rubber & Asbestos Mfg. Co.
S 70—Sun Novelty Co.
S 72—Sunset Rubber & Supply Co.
S 74—Sussex Rubber Co.
S 76—Swinehart Tire & Rubber Co.
T 2—Taunton Rubber Co.
T 4—Ten Broeck Tyre Co., Inc.
T 6—Thermoid Rubber Co.
T 8—Tilton Rubber Mfg. Co.
T 10—Toronto Rubber Co., Ltd.
T 12—Transparent Rubber Co.
T 14—Traun Rubber Co.
T 16—Tyer Rubber Co.
U 2—U-Glu Supply Corp.
U 4—United & Globe Rubber Mfg. Co.
U 6—United Shoe Machinery Co.
U 8—United States Asbestos Co.

U 10—United States Rubber Co. See Advertisement on Page 367.

U 12—United States Tire Co
V 2—Vail Rubber Co.
V 4—Van Cleef Bros.
V 6—Victor Balata & Textile Belting Co.
V 8—Victor Rubber Co.
V 10—Viscol Company.
V 12—Voorhees Rubber Mfg. Co.
V 14—Vulcalose Co.
V 16—Vulcan Asbestos Mfg. Co., Inc.
V 18—Vulcan Proofing Co.
V 20—Vulcan Rubber Co.
V 22—Vulcanized Products Co.
V 24—Vulcanized Rubber Co.
W 2—Waitt Cement Co.
W 4—Wales Goodyear Rubber Shoe Co.
W 6—Washburn & Moen Mfg. Co.
W 8—Waterman, L. E., Co.
W10—West American Rubber Co.
W12—Western Electric Co., Inc.
W14—Western Reserve Rubber Co.
W16—Western Rubber Co.
W18—Westinghouse Electric & Mfg. Co.
W20—Whitall-Tatum Co.
W22—White, S. S., Dental Mfg. Co.
W24—Whitehead Bros. Rubber Co.
W26—Williams-Bowman Rubber Co.
W28—Wilson Tire & Rubber Co.
W30—Wire & Cable Co.
W32—Wohlberg, Richard.
W34—Woodward, F. E., & Sons.
W36—Woodworth Mfg. Co.
W38—Woonsocket Rubber Co.
W40—Worthington Ball Co.
W42—Woven Steel Hose & Rubber Co.
X 2—Xenia Rubber Mfg. Co.
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THE
RUBBER AGE
AND TIRE NEWS

JANUARY 25, 1918 VOL. II. NO. 9

Member of the Associated Business Papers, Inc.

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THE
RUBBER AGE
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Rubber Reclaiming

By A. Marcus

Treasurer of Somerset Rubber Reclaiming Works

The art of reclaiming rubber has been perfected to the point where reclaimed stock can be produced for use in almost any class of rubber compound. The extent to which reclaimed rubber is used in the manufacture of new rubber goods is such that rubber reclaiming has become an essential branch of the great industry.

The receiving department of the rubber reclaiming plant turns arrivals of old rubber scrap over to the salvage department, where it is sorted and graded for each particular purpose. This sorting and grading is performed by men who are trained by years of experience in the scrap rubber business for this work.

Pile of Old Tires in Warehouse

After being sorted, the scrap is consigned to suitable bins and samples are taken at random and sent to the laboratory for chemical and physical analysis, and the report of the analytical work is placed before the chief chemist who decides upon the reclaiming process and instructs the factory superintendent accordingly. The superintendent faithfully carries out the instructions of the laboratory.

Alkali Process

The lye used in the alkali reclaiming department is purchased according to sealed samples deposited in the reclaimer's laboratories and when shipments come to the works additional samples are taken, tested and approved or rejected by the laboratories. If accepted this lye is stored in a special warehouse where it is held at the proper temperature and relative humidity. This is essential to guard against the danger of its absorbing moisture which would bring about a chemical transformation and convert the lye into carbonate of soda.

Preparation of Scrap

Prior to being subjected to the alkali treatment, the rubber scrap is cracked and ground, sent over a magnet to remove all particles of metal, and then conveyed to screens where it is agitated to insure proper fineness for devulcanizing. The powdered stock is conveyed to the alkali department where it is mixed with lye of suitable strength and then run into the devulcanizers.

Steam is turned into the devulcanizers to make the stock plastic. This treatment destroys the textile fibers contained in the rubber, dissolves its free sulphur and saponifies the substitutes that may be mixed with the stock. The steam pressure in the devulcanizer is held at the proper point throughout the devulcanizing process.

Each devulcanizer is equipped with a temperature regulator which prevents the temperature from varying. Uniform temperature is essential, for if it is not maintained the reclaimed rubber will not be uniform in quality.

The alkali department is one of the most costly in equipment due to the high class of conveyors, mixers, devulcanizers and temperature regulators that must be used. The men in this department wear rubber suits, rubber boots and gloves. Though all the lye is handled through pipe lines,

SCENE IN CUTTING AND BEADING ROOM

the workmen also have to wear goggles to protect their eyes. Compressed air is used to force the lye through the pipe lines. All the moisture is removed from this air before it enters the lines by passing it through calcium chloride.

The lye used in rubber reclaiming is made up in different degrees Beaumé, tested for its alkali content, as each grade of scrap has to be treated with an appropriated solution of lye and under a suitable pressure for a required length of time.

Acid Department

Another method of reclaiming rubber consists in treating it with sulphuric acid for removal of fiber and mineral contents.

The acid comes to the reclaiming plant in tank cars from which it is run through pipe lines to storage tanks enclosed in a concrete housing. Compressed air is here again used for forcing the acid through the pipe lines. Samples are drawn from the tank car and sent to the laboratories for testing, for it is very necessary to know the exact strength of the acid.

The acid room contains large lead-lined vessels provided with mechanical agitators. The covers of these vessels are jacketed for running water through them to condense vapors. The liquid produced by this condensation is run back into the tubs and the acid is thus kept at the required strength. The jacketed covers of the vessels by condensing the vapors also protect the men from ill effects.

The acid is forced by compressed air from the storage tanks into the devulcanizing vessels where the required degrees Beaumé are obtained by diluting it with water. The pulverized rubber scrap is conveyed into the vessels and kept in the acid for a predetermined length of time. When this time is up, the solution is emptied into a receiving tank and thence into the riffler.

Riffling

The riffler is a long trough with blocks of wood laid crosswise; the object of these blocks being to obstruct the carrying along of sand and other foreign matter that has not been eliminated by the chemical treatment.

SCRAP SORTERS AT WORK

THE LABORATORY

Thousands of gallons of water are forced into the riffler, carrying along the stock and removing foreign matter. Riffling also helps to remove acid or lye which, if left in the stock, would have injurious effects upon it and upon the compounds in which the stock is used. For instance, were traces of unneutralized acid allowed to remain in reclaimed rubber for insulating stock, it would cause a chemical reaction on the copper wire. This reaction would be exceedingly bad for the salts of copper which would be formed and would gradually destroy the rubber. On the other hand, traces of alkali, if not neutralized, retard the cure of all rubber goods. Up to one-half per cent alkali has an accelerating effect on the cure of rubber goods; beyond this, however, it retards vulcanization, and where there is as high as five per cent of alkali it is almost impossible to effect a cure. Therefore, the removal and

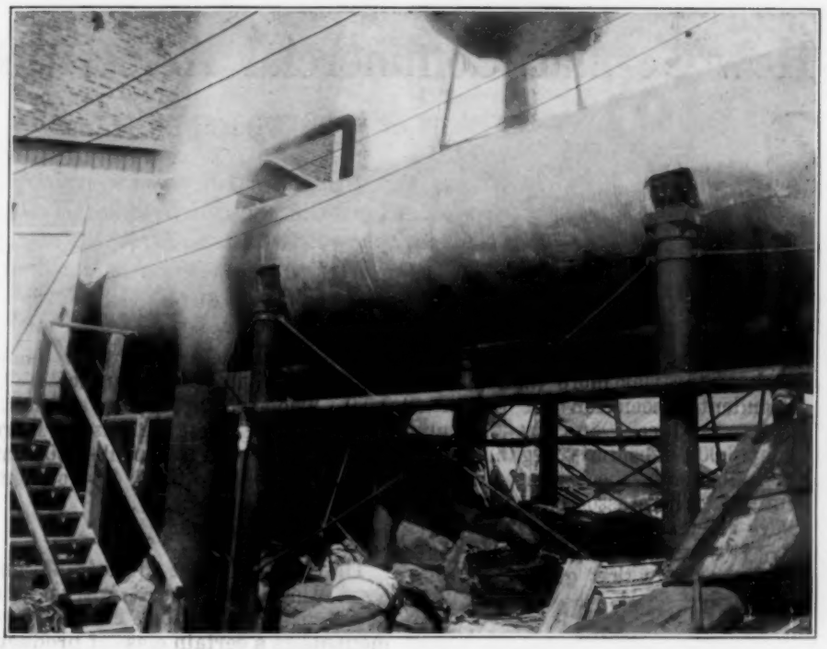
neutralization of both alkali and acid must be performed with care and the riffling is only part of the eliminating process which is followed by washing.

Washing

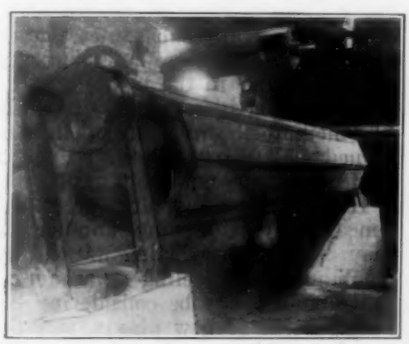
After going through the riffling and a neutralization process, the stock is washed in a large "tumbler" washer which rotates at high speed. Water, under high pressure, is driven through this washer. Cold or hot water is used, according to the nature of the stock that is being treated. Some reclaimed rubber is washed on regular washer rolls just as crude rubber. This method is used for stocks reclaimed for use in wire insulating, and similar high-grade shoddies.

Drying

The drying of reclaimed rubber is one of the most important processes in a rubber regenerating plant. The drying department has to be scrupulously clean and special care has to be exercised to keep out dust which spoils the intrinsic value of reclaimed rubber. Dirt in reclaimed rubber causes lumps when the rubber is cured and lowers the tensile strength of the product.



LARGE HORIZONTAL DEVULCANIZER



A "TUMBLER" WASHER

Numerous methods are employed for drying reclaimed rubber. Different stocks have to be dried in different ways. Vacuum, open screen, loft driers, and kiln driers are used. The drying room should always be completely isolated from the rest of the factory and should be as remote as possible from the boiler room and other dust-producing centers. For cleanliness, the workmen employed in this department should be provided with white overalls.

Mill Departments

In our factory we have found it advisable to have two distinct mill rooms, one for white reclaimed, and one for other reclaimed stocks.

The equipment of these departments consists of large rubber mills, refiners, separators, shredders, screeners, sheet cutters, sheeting mills and temperature-control devices. Some of the mills used in these departments require 120 h.p. to drive them under load.

In our works we have found it best to mark and paint water and steam lines in different colors to distinguish them. We have also found it advisable to standardize all valves, reducing valves and similar devices. We also have a complete system of exhaust fans which carry injurious vapors and dusts to the ash pit in the boiler room where they are consumed. We use vacuum cleaners for cleaning belt lines, work rooms and machinery.

The mill rooms turn out the finished product from which samples are taken for chemical and physical analysis in our laboratories prior to packing and shipment, thus insuring uniformity in our output.

Announcement is made that the 1918 edition of "Motor Trucks of America," of which S. V. Norton, manager of the truck tire sales of The B. F. Goodrich Rubber Co., Akron, Ohio., is the author, will be ready for distribution about the first of February. The book contains complete specifications of nearly 150 of the leading gas and electric-driven trucks.

BATTERY OF ACID TUBS

How German Commercial Associations Regulate Trade

By William M. Milner

In view of the attempts that have been made by the Federal Trade Commission to develop business associations in this country and the rapidly growing tendency to regulate business through Federal action, this article, which describes the before-war conditions of avoiding undue competition in Germany, is of special interest at this time.

There were in Germany at the outbreak of the war more than 600 independent associations of manufacturers, producers and traders, and about 6,000 subsidiary organizations, all influencing the business of the country. These associations are generally referred to as *cartels* or *kartels* from the term employed to designate the agreements that give them their powers.

Cartels

Cartels are associations of business firms with the object of maintaining profitable prices, regulating production, resisting both domestic and foreign competition, and purchasing raw materials in common.

The reason for cartels can best be explained by an illustration: Let us assume that a certain people purchase annually, on an average, 100,000 of a given article. Not one of the individual makers of that article knows this average number. Each working independently, is striving within his means to get ahead of his competitor to win for himself the bulk of the business. The day comes when, instead of merely producing the 100,000 of these articles needed, the manufacturers are turning out 120,000. These extra 20,000 that are not needed spoil the profits on the 100,000 for which there is demand, and they are sold at a discount with the result that for the time being all producers suffer.

In political economy, one mistake brings about another and overproduction invariably increases in times of overproduction. The reason for this is that each individual manufacturer believes that by manufacturing on a larger scale than his competitors he will lower his production cost and be able to undersell them. But, the reckoning of one is upset by that of the other and it is not long before the merchandise depreciates, gluts the market, and the crisis that results claims victims.

The simplest way of preventing overproduction is by limiting output, and to do this it is essential that all producers of a kind get together.

The idea of trade associations is not new. There were such organizations in the Middle Ages. The beginning of the modern form of trade cartels dates back to the first Rhenish-Westphalian Coal Syndicate, in 1850. The great prosperity and multiplication of these cartels is more recent and it was not until 1900 that they entered into full development along these lines.

Not Trusts

These cartels are quite different from American trusts. A trust is a group of organizations combined to monopolize a certain class of products that buys the mills and the patents of all the producers and owns them. Then they arrange to prevent competition. The trust is monopoly in its highest form. The cartel, on the contrary, is, at its inception at least, a child of necessity.

Why Cartels First Developed

The successful development of cartels in Germany can be attributed to two main causes: first, the education of Germans which accustoms them from their early youth to the discipline of association and solidarity, and trains them to subject their personal interests to those of their fellow-citizens; second, the fact that of all European countries Germany has developed most rapidly.

Had it not been for the regulating influence exercised by cartels, general anarchy in production, disorder and bankruptcy would have taken the place of the prosperity that prevailed there prior to the war. Even with the restraining force of cartels, the country has experienced serious economical disorders, due to excessive rate of industrial and commercial development.

A Successful Cartel

If a cartel is to be successful, all of its members must be unified. They must agree and respect their agreements.

In the first step towards bringing a man or a concern into a cartel, persuasion is used. It is made clear to the person solicited that, under existing conditions, the more he produces, the more he is forced to lower his selling price for the reason that his competitors are doing just what he is doing. Therefore, there should be an understanding to produce less and maintain reasonable prices.

It is not until after the manufacturer has understood the value of this argument that real difficulty begins. Then he wants to know in what proportion to the production of his competitors it is proposed to reduce his own production.

In the case of the manufacturers' cartel in the illustration referred to, the restriction of 20,000 articles will have to be distributed among all the members of the cartel, and this has to be done without hurting anyone of the manufacturers' feelings. It is no easy problem. The usual method of solving it heretofore has been to name a commission of three or five men and as many substitutes, chosen because of the absolute confidence they command in the trade.

This commission works diligently to conciliate the interests of all concerned and distributes the reduction in production as equitably as possible.

Here is where difficulties arise: one concern may be growing; another one may have been widening its field by doubling its traveling sales force; still another may be considering the construction of new plants, and the purchase of improved equipment. Or on the other hand accidents may have temporarily reduced production: fire, the death of a manager, a removal, a strike, or something else is the fault. All these things have to be taken into account.

To determine the share each concern is to have in a cartel, the usual method is to take its total production once, add to this twice the total average of goods delivered annually and divide the grand total by three. For instance: the total production of a factory may be estimated at 100,000 marks. The average of deliveries made by it for the last three years, account taken of all circumstances, may be 85,000 marks' worth of goods. Its share in the cartel will then be 100,000 marks plus 170,000 (twice 85,000 marks), which equals 270,000 marks. This total divided by three gives 90,000 marks as the allotted production.

Often people who are ready to go into a cartel change their minds when they come to the restrictive clause in it. For this reason it is a problem to find people who are resolved beforehand to submit to the arbitration of the commission, for, afterward, they

never consent to abide by it and, if they can, they quit the cartel.

It is difficult to make people see that where they are losing money, or making very little of it while manuturing in large quantities, it will be possible for them to earn more money by manufacturing less. If they have not pledged themselves before coming to this stage in the formation of a cartel, some will withdraw definitely with the hope that the cartel will cause an increase in prices that will benefit them so much the more because they will be free while the production of their " associated " competitors will be restricted. Others hold off to come in later hoping that special inducements will be offered.

The cartel, therefore, finds itself at a time facing recalcitrants who would take advantage of the benefit of the agreement without entering into it and without having to labor under any of its restrictions. These enemies of collectivity have to be reduced at all costs. They are a danger to the members of the cartel with whom they compete with unequal advantages.

They threaten the very existence of the cartel, for the members of it, seeing them reap benefits, are tempted to imitate them and leave the cartel.

If these outsiders are not brought to account, similar industries will grow up to benefit by the rise in prices, for it has been noted that when an industry is progressing, everybody wants to get into it; kindred industries are especially active in seeking a share in the prosperity. When the woolen industry is particularly prosperous cotton people go into it and vice versa. If the cartel is to have any influence its adversaries must lose their prestige; the cartel must destroy it.

Means Cartels Use

Cartels use various means to overcome their competitors. First there are " fighting prices," that is to say that they resort to price cutting. The members of the cartel hold a meeting and decide to sacrifice 50,000 marks each to do away with their competitors. If there are a hundred members the " war fund " will amount to five million marks. When, after a year or so of struggle, the recalcitrants have been unable to sell their goods otherwise than at a loss, they will surrender if they have not already gone bankrupt.

Another way is to cause strikes in the mills of the non-unionists. This is easily done by increasing wages in the mills belonging to members of the cartel; the workmen in the other plants will demand the same increase. If the manufacturers consent, their overhead expenses increase until they become prohibitive; if they refuse, the workmen go on strike, and the result is the same: the non-conformists go into bankruptcy or they surrender.

Once a nucleus is formed there are a thousand and one other methods of forcing all members of an industry into a cartel.

Duration

Cartels are rarely entered into for more than three, five or ten years and when they expire it is sometimes hard to renew them. Generally, however, they are extended, but with difficulty. Man is so used to competition, and freedom, he relies so much upon his ability, his personal ingenuity, that he soon forgets what he suffered from unrestrained competition.

Cartels will continue in Germany after this war. They are schools of social solidarity of which the scholars are likely to spread all over the world.

Advantages of Cartels

The advantages of cartels are evident. They saved the German coal industry from ruin and they brought prosperity to the steel industry. In 1900 they shortened the crisis the country suffered that year, and the cooperation of the large ones limited production and brought back prosperity.

Cartels afford security to employers who earn more while producing less and are thus able to make profits without resorting to overproduction. They lower overhead expenses and do away with undue competition.

They are also a benefit to labor for they reach agreements with its unions, reduce chances of strikes and remove dangers of fluctuations in wages. By limiting production they insure constant employment to the working people. The public also benefits by cartels for prosperity prevails wherever prices are not too low.

Danger of Abuses

Cartels are not likely to abuse their power; it would be contrary to their interests to do so for public opinion would soon bring them to account and keep them inside reasonable limits. By regulating production they eliminate speculation for which producers and consumers pay and which only benefits speculators. They reduce the cost of goods because by purchasing raw materials in huge quantities they reduce cost of production.

Limits to Cartels

Cartels are limited in their expansion by the competition of equivalents; wood can take the place of iron and iron can take the place of wood. When parquet floors become too costly, linoleum takes their place; gas can answer many of the purposes of electricity; foreign competition also exercises a restraining influence.

If a cartel becomes too rich it is not long before it has a competitor. Consumers form cartels to protect themselves against excessive prices for necessaries of life. A few years ago the German sugar cartel was selling sugar export at prices far below those allowed to the home trade and a cartel resulted among chocolate manufacturers who began to produce their own sugar.

Attitude of Government

The ever increasing power of cartels worried the German government long before the war. In 1905, there was a cartel investigation and the cartels refused to allow the government to have information that might be used against them.

The only result of the investigation was the following classification of cartels:

1. Cartels for fixing the minimum prices of goods;
2. For establishing sales branches for certain products;
3. For the wholesale purchase of raw materials and for the sale of goods;
4. For regulating conditions, sales terms, discounts, trade zones.

Disadvantages of Cartels

Cartels lead to abuse of power, exaggerate increase in prices; not serious, but to be feared. Being creations of man they cannot be expected to be perfect but they have proven in the long run to be not as dangerous as unrestrained competition.

Some lines of activity followed by cartels would, of course, be violations of the American anti-trust laws but there are possibly many fields which would afford room for legitimate action on the part of American trade associations. Foreign trade offers a particularly promising field.

Rubber Plantations in East Africa

The extensive areas planted in rubber by the Germans in their former colony of East Africa consist chiefly in Ceara (*Manihot*) rubber trees.

The *Manihot* is not as good a producer as the *Hevea brasiliensis*, which yields the bulk of the crude rubber coming from Brazil and the East, but it thrives in dry climates where the *Hevea* cannot develop. Unlike the *Hevea*, the *Manihot* cannot be conserved and tapped year after year and expected to produce more and more rubber as it grows older. Tapping produces a thickening of its bark, which gives the tree a bottle-shaped appearance, and after four or five years' tapping, productivity ceases. The trees are then cut out to make room for young plants which begin to yield after about two years growth.

Technical Course in Rubber Manufacture*

By H. E. Simmons, M.S.

Professor of Chemistry in the Municipal University of Akron

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SECTION XIV

The Manufacture and Use of Inorganic Fillers (*Continued*)

Under the third division of our subject, fillers will be considered in the meaning which the word itself implies: substances which are not used on account of any good property which they impart to the rubber, nor on account of any color which they may produce in the finished product. In other words, they are cheap materials which to a certain extent may be used in the place of more expensive substances. Their amount is regulated by experiment so that too much will not be used and thus impair the finished product.

Barytes

The first one of these for consideration will be barytes, or heavy spar. It is found in nature in a comparatively pure form, in fact, with so high a degree of purity that it needs no other preparation than that of grinding to a fine powder. It may be found in shades varying from a good white to a gray, depending upon the per cent of barium sulphate present.

It is obtained also by artificial means. First, the mineral or natural sulphate is heated in a furnace with carbon when there results the sulphide and oxide of barium. These are then dissolved in water and sodium sulphate added and the insoluble artificial barium sulphate, barytes, is precipitated.

Second, it is made by dissolving the mineral with erite, which is the carbonate of barium, in hydrochloric acid, and then adding sodium sulphate, when the barium sulphate results.

It has a specific gravity of 4.5 to 4.6 and is obtained very often under the name of "permanent white" or "blanc fixe." Due to its high specific gravity, it is employed to increase the specific gravity of some stocks. The artificial product is to be preferred to the natural one as it is amorphous while the ground mineral, even though it is reduced to a fine powder, still retains more or less its crystalline structure. It is used to adulterate white lead, and to a certain extent, has the advantage of not being effected by hydrogen sulphide or metallic sulphides.

Aluminum Compounds

There are several compounds of aluminum which are used as inert fillers.

"Aluminum flake" is a natural product coming in several different colors from white to gray and gray to brown. It has a specific gravity of 2.5 to 2.6 and is used to a certain extent in place of zinc oxide.

Aluminum oxide does occur in nature but the artificial product is the one desired for use in rubber. In the Bayer process the mineral bauxite is calcined and pulverized, mixed with a little lime and then treated with sodium hydroxide solution of 45 de. Bé, at a pressure of three to four atmospheres. Sodium aluminate results which is soluble in water. It is then filtered hot and, after suitable dilution, pure gelatinous aluminum hydroxide is added. It is then agitated for from five to six days when all of the aluminum is precipitated both from the bauxite solution and from that which was added. It is then recovered by a filter press, then thoroughly dried, when a fine white powder results with a specific gravity of about 3.9. It was with the use of this oxide that Eaton suggested the making of a pure white rubber.

The hydroxide of alumina is now coming into use in some factories. It is one of the lightest gravity materials possible to obtain.

Kaolin, or China clay, is a natural occurring product. In chemical composition it is a hydrated silicate of alumina. It acts as an inert filler in all the rubber compounds. It has a specific gravity of 2.3 to 2.6. It should show an ignition loss of 11 to 14 per cent and should not be attacked by dilute acids. It often runs very high in moisture which, of course, must be guarded against.

Talc

Talc is a silicate of magnesia occurring native in the earth in a state of purity sufficient that it may be reduced to a powder and used directly in the industries. It is not used to any great extent in rubber stocks but is employed a great deal in all kinds of work to prevent surfaces from sticking together. Molds are dusted over with it to keep the rubber from adhering to them during vulcanization. Some goods are buried in it during vulcanization.

Talc has a specific gravity of 2.7. When it is used in compounding, it imparts to the rubber, smoothness and stiffness, and also increases electrical insulation when used in cable coverings. A common adulterant is calcium carbonate, which is detected by the effervescence when treated with an acid.

Soapstone is really a form of talc and as such, is used in large quantities.

Silicon Oxides

There are other materials on the market under different names which are in reality the same from a chemical point of view. Silica, Atmoid, Infusorial Earth, Fossil Flour and Mountain Flour are all names given to the oxide of silicon. This material occurs in a great many different forms in nature. All forms are without material effect upon rubber compounds, other than stiffening the product to some extent. They have a low specific gravity ranging between 2.7 and 2.9.

These materials are made from the skeletons of microscopic animals. Large deposits are found in Nova Scotia and Germany.

Asbestos

Asbestos is a silicate of magnesia with a verying amount of the magnesia replaced by lime, together with ferrous oxide and alumina. Large deposits of it are found in Italy, Canada and Cape of Good Hope. It is used both as fiber and as powder. The fibrous form is used in mechanical goods for it increases the toughness and unyielding quality of the structure. It is used in goods that are subjected to a high temperature and also in articles like brake blocks.

Calcium Carbonates

Chalk or whiting is the carbonate of calcium. It occurs in nature in several modifications, as limestone, chalk, and marble. The chalk deposits are the remains of microscopic marine animals. Chalk is obtained in fine white grade.

Whiting is really purified chalk, made by grinding the chalk, then floating it and the fine white sediment is obtained by running it through a filter press. It is then dried rapidly. If, during the drying, too high a temperature is used, the product will feel harsh. It is slightly deliquescent therefore it must be kept in a dry place; otherwise it may cause trouble in the stock where it is used.

* This course commenced in the July 10, 1917, issue of THE RUBBER AGE AND TIRE NEWS and will be complete in 28 issues.

Large quantities of whiting are used in the rubber business on account of its cheapness. It has a specific gravity of 2.7 to 2.9. It will increase the resiliency of rubber and also increase its hardness without producing the "stony" effect that other ingredients do.

Sulphides

We find in nature mineral deposits of the two sulphides of lead and zinc. If such ore is smelted with a mixture of coal and lime, it produces what is known as Blue Lead. It is an extremely fine powder and possesses a high specific gravity. It is a cheap product and, to a certain degree, hastens the rate of cure in the stocks where it is used. Therefore, it may be used in the place of litharge and will also produce the fine black product.

Magnesium Carbonate

Magnesium Carbonate, which was mentioned under the first class is also used as a filler.

White Pigments

Under our third group, White Pigments, may be discussed materials which might have been grouped under fillers. This will be true of all the divisions which follow.

Zinc Oxide

The first and most important of the white pigments is Zinc Oxide. No one pigment is used as extensively as this one in the manufacture of white rubber goods.

It may be made by roasting any one of the zinc ores, but the best method is that of burning the pure metal. The trouble with roasting the ores lies in the fact that lead, iron, and copper are very often present in these and thus will be found in the finished product.

A good sample of zinc oxide should dissolve completely without effervesceing in a 10 per cent solution of acetic acid. If it is desired to test for the presence of iron, lead or copper, in the oxide, all that is necessary to do is to dissolve the specimen in dilute hydrochloric acid, and conduct hydrogen sulphide into it. If it is free from the above metals, there will be no preciptate formed.

Inferior grades of zinc are often adulterated with barytes, whiting, or kaolin and the presence of these will be detected when the sample is treated with acetic acid. The barytes and kaolin are both insoluble and the whiting will produce the effervescence. White lead is sometimes an adulterant.

Zinc Oxide has a specific gravity of 5.5 to 5.6. Although it is one of the extensively used white pigments, yet it is not all that is to be desired. Its covering power is only moderate and during vulcanization, it turns to a yellow color. The higher the temperature and longer the period of vulcanization, the more pronounced this color becomes.

Another defect of zinc oxide is the fact that dilute acids will dissolve it out of the vulcanized rubber goods. As a result of this, certain countries prohibit its use in rubber articles which come in contact with foods or beverages in their preparation.

Zinc Sulphide

A white pigment which has increased in favor rapidly, is zinc sulphide. It occurs in nature in the mineral known as zinc blende, but the product used in rubber is an artificial one. It may be produced by causing zinc dust and vapors of sulphur to come together at an elevated temperature. It may also be produced by precipitating it from a solution of zinc with ammonium sulphide.

It is a white powder with a specific gravity of 3.3 and possesses greater covering power than the oxide. It has the distinct advantage of not changing to the yellow tint during vulcanization, and it is not leached out of the rubber by dilute acids as is the oxide. It is liable to the same adulterations as the oxide is plus the oxide itself. The best grades of zinc sulphide should run as high as 90 per cent. purity.

A very good method of determining its purity is to place about 0.2 of a gram of the dried material in a flask and shake it up with 50 c.c. of N/10 iodine solution. Five c.c. of concentrated hydrochloric acid are then added and the whole is allowed to stand a couple of hours with occasional shaking. By this time, all of the white particles should have disappeared and the excess iodine is then titrated with sodium thiosulphate solution. Each c.c. of the iodine solution which reacted with the hydrogen sulphide, produced when the acid was added to the zinc sulphide, is equivalent to 0.00485 grams of the sulphide. Thus its purity is easily calculated.

Lithopone

Another zinc pigment which was first used in paint and now extensively in rubber, is one known as lithopone. It is an artificial product, made by bringing together two solutions of barium sulphide and zinc sulphate, when the following reaction takes place:

$$Ba\,S + Zn\,SO_4 \rightarrow Ba\,SO_4\downarrow + Zn\,S\downarrow$$

The two resulting products are both insoluble and it is thus mixture of zinc sulphide and barium sulphate which is known as lithopone. It has a specific gravity of 3.8 to 4.2 and should contain 70.5 per cent of barium sulphate and 29.5 per cent of zinc sulphide. It varies considerably however, from these per cents, depending upon the method of preparation.

Of course, the valuable part of it is due to the zinc sulphide and there is a standard grade of lithopone, known as "Blue Seal," which is guaranteed to have 30 per cent of zinc sulphide. For general purposes it is necessary only to examine a sample for moisture, acid insoluble, and sulphide.

The acid insoluble is determined by boiling one gram of the dried sample with concentrated hydrochloric acid, diluting and boiling again and then filtering, drying and igniting the residue in a platinum crucible, and then weighing. This residue should not exceed 70 per cent.

To detect the presence of kaolin as an adulterant, a little hydrofluoric acid may be added to the residue, evaporated off, and reweighed, and any loss in weight represents the presence of silicates.

What was said in regard to the use of zinc sulphide may be said of lithopone.

Barytes and Kaolin

In addition to these white pigments, may be mentioned barytes and kaolin, which were considered under fillers.

Red Pigments

The next class of pigments for our consideration are those which impart a red color to rubber goods.

Golden and Crimson Antimony

The first to be mentioned are Antimony Golden and Crimson, and these two are divided into grades according to color, for instance, Golden No. 1, Golden No. 2.

The Crimson Antimony is little used by itself but is made by boiling together antimony trichloride and thiosulphate solutions, when the trisulphide of antimony is precipitated.

Then colors varying from this crimson to orange are produced, the shade depending upon the conditions of precipitation or upon the respective percentages of crimson and golden sulphides in the mixtures.

The golden sulphides are the ones in commonest use. These are made by boiling powdered stribnite, which is the mineral containing the natural sulphide of antimony, with alkaline polysulphides when there results sulfantimonate in solution. When this sulfantimonate is treated with hydrochloric acid there will be precipitated a mixture of the sulphides of antimony and also some free sulphur resulting from the polysulphides.

One form of the orange antimony is co-precipitated with hydrated calcium sulphate and is called "plastered antimony." This grade, of

course, is cheaper and does not contain as high a per cent of the red pigment.

When it comes to determining the true worth of a sample of antimony, the best method is to subject it to actual vulcanization experiments, because it is found that some antimonies will not hold their color during vulcanization. This fact cannot be ascertained by chemical tests.

In analysis the following determinations are generally made: moisture, free sulphur, antimony, calcium sulphate, sulphide-sulphur.

The free sulphur present is what led many to believe for a long time that antimony red was a vulcanizing agent. In fact, even now some manufacturers claim that they obtain better results if they mix the sulphur into the antimony which they use in the compound. To supply such a demand the producers of sulphurated antimony put free sulphur into it up to the extent in certain cases of 40 per cent. It is determined by extracting a weighed amount of antimony in a Soxhlet extractor with carbon disulphide or acetone for about eight hours. The solvent is evaporated and the amount of free sulphur calculated.

The antimony itself, iron and calcium sulphite are determined in the usual manner. The sulphide sulphur is calculated by determining the total sulphur in the extracted sample and subtracting from this the sulphur present in the sulphate.

In connection with the use of the sulphides of antimony, we shall publish some of its merits as put forth by a prominent manufacturer:

"*First*—Antimony Sulphuret used in the curing of rubber acts as a sulphur carrier causing all of its free sulphur to unite with the rubber. Sulphur added as a sulphuret is taken up completely by the rubber. Therefore it is not necessary to add an excess of sulphur.

"*Second*—On account of the above, 'blooming' does not take place for practically none of the sulphur is left uncombined in the rubber.

"*Third*—On account of the above, vulcanization can be carried on at a lower temperature; thus the tendency to overcure is diminished.

"*Fourth*—On account of the above, the rubber has a longer life. It can be kept much longer than gray rubber before it will begin to deteriorate.

"*Fifth*—It has more elasticity. This is shown by the following test: A piece of red rubber tubing and a piece of gray tubing are bent firmly and pressed with a spring clothespin clip. The two samples are allowed to stand in the sunlight for several days when the clips are removed. It will be noted that the properly antimony-cured red tube will spring back into its original shape immediately upon removal of the clamp. The gray tube goes back into its old form slowly. In use this is noticed when a tire goes flat over night. The red tube allowed to bend by the weight of the car will immediately spring back into place when the weight is removed. The gray tube will remain bent even after the weight of the car is lifted.

"In a large lot of returned shelf goods, half gray and half red, the following was noticed. The gray tubes when removed from the cartons were in bad shape. They could not very well be unfolded as their creases seemed to be permanent. The red ones, however, were in just as good shape as the day when they left the plant more than a year before and they were simply transferred to new cartons and placed on sale. The gray tubes were covered over with a thick coating of sulphur bloom while the red ones were entirely free from bloom. The superintendent of the plant pointed out the fact that the only difference between the two stocks was that the gray ones had obtained all of their sulphur from sulphur flour while the red ones obtained the larger part of their sulphur from antimony sulphuret."

Due to the oxidization of the sulphur, we find that most samples contain free sulphuric acid. The amount should never exceed 0.06 per cent.

Iron Sesquioxide

There are several terms used for practically the same ingredient, the sesquioxide of iron. We see it sold as Rouge, Red Ochre, Venetian Red, Red Hematite and under a few other names. In general use they are all inferior to the antimony colors, but they are useful in the manufacture of non-poisonous articles and hard rubber, where it behaves better than the antimony.

Rouge

Rouge is made by calcining the sulphate of iron and if this is done in the presence of barium or calcium sulphates, a more brilliant color is obtained. It has a specific gravity of 5.0 to 5.2.

Red Ochre

Red Ochre is made by heating yellow ochre, which is a clay containing siliceous matter along with a hydrated iron oxide. So the red ochre is really a rouge diluted with a siliceous matter and is consequently of less value than the rouge.

Red Hematite

Red Hematite is the mineral ferric oxide and is of sufficient purity and of such a color that it is used as a red pigment in ebonite and articles that must be heat-resisting.

Venetian Red and Indian Red are artificial ferric oxide.

Vermillion

Vermillion is a sulphide of mercury and is the most brilliant of all red pigments, likewise the most expensive, therefore, not used so extensively. It is employed in dental rubbers and must be free from all soluble mercury salts.

It occurs in nature as the mineral cinnabar. It is produced artificially by heating the black sulphide in a covered cast-iron pot and the cinnabar will be sublimed. This is often purified still further.

It is adulterated with iron oxide, red lead and sometimes gypsum. Its purity is easily tested by heating some in a porcelain dish. If no adulterant is present it will completely volatilize, leaving no residue.

Black Pigments

Under Black Pigments, occur largely different grades of carbon, the commonest being lampblack.

Lampblack

This is made by collecting the carbon which results from the incomplete combustion of oils, fats, resins, coal and like organic bodies. As a result of the varied starting out materials, we naturally get varying grades of lampblack. It generally contains some greasy materials and the amount of these present should be determined, by an acetone extraction.

Lampblack should not show more than 5 per cent of grease and should leave practically no ash. Lampblack has a specific gravity of 1.8 and has come into extensive use just recently.

A short time ago it was used only in boots, shoes, carriage cloth, and druggist supplies but today it is one of the important ingredients used in a large number of mechanical goods and extensively in tire stock, where it appreciably increases the strength of the stock as well as its wearing surface.

Bone Black

Bone Black is obtained by calcining defatted bones in closed vessels out of contact with air. This grade of carbon, therefore, runs very high in mineral matter, very often equaling 90 per cent of the whole. It is coarse and harsh, even after grinding and, although a black pigment, finds only limited use.

Gas Carbon

Gas Carbon is a pure grade of lampblack which is quite popular with certain manufacturers at present.

Black Hypo

Black Hypo is a pigment which has been used in the past to some extent but is received with less favor at present. It is made by heating together a mixture of litharge, sulphur and lampblack. The composition of the resulting product is uncertain. It contains some lead sulphide, a little free sulphur and some of the lead salts of oxygen sulphur acids. It has been made by adding sodium thiosulphate to a solution of sugar of lead, when the white lead thiosulphide is precipitated, and is sold as white hypo. If, however, this is heated, it changes to black due to the formation of the sulphide. During the vulcanization process, if white hypo has been used, it will suffer the same change and produce a black rubber. Its use at present is waning.

Graphite

Graphite is a form of carbon occurring in the free state in a high degree of purity and is also an artificial product today. It is made in electrical furnaces, where coal is subjected to a very high temperature for a period of twenty-four hours.

Graphite is used in rubber goods more as a filler perhaps than as a pigment. Its coloring power is not very great. It will stiffen rubber articles and has remarkable lubricating properties, preventing the rubber from sticking to metals. It is used in the compounding of steam jointings and goods that are going to be subjected to a high temperature.

Lead Sulphide

Lead Sulphide is also used as a black pigment, whether it is added as such as in the form of some other lead salt which changes into the sulphide during vulcanization. It is the most abundant form of lead and found in nature as galena.

Yellow Pigments

Now we will mention some of the common yellow pigments.

Yellow Ocher

Just as we had a red ocher so there is a Yellow Ocher. The red variety is the pure ferric oxide, but if this is mixed with clay or siliceous matter, it loses its red color and varying shades of orange and yellow result. It is a natural occurring product and is inert in rubber. It is very cheap and the color it produces in rubber lacks brilliancy.

Chrome Yellow

Chrome Yellow is the chromate of lead and is made by adding a solution of sodium chromate to a solution of lead acetate, when the yellow precipitate is produced. It finds extensive use in the manufacture of toys and cold cured goods, where its lead content does not interfere.

Cadmium Yellow

Cadmium Yellow, which is the sulphide of the metal is one of the best yellow pigments. It is made by passing hydrogen sulphide into a solution of a soluble cadmium salt. It gives to rubber a fine yellow color and is not affected by vulcanization. It may be used in toys as it is non-poisonous. The cost of this material has practically eliminated its use.

Arsenic Trisulphide

Arsenic Trisulphide is an excellent yellow pigment as it is not affected by vulcanization, but it is so extremely poisonous that its use has been almost abandoned. When it is mixed with a small amount of zinc oxide, it will produce a beautiful cream colored yellow.

Yellow Dyestuffs Used

The yellow colors are found largely, however, in toys, surgicals and tilings, and beside the pigments mentioned above, to-day we find large quantities of organic dyestuffs being used instead of the mineral pigments.

Green and Blue Pigments

Green and blue pigments are used in the same line of goods as the yellow ones, and they too are being replaced by the organic dyestuffs. A few of each, however, are still important enough to be mentioned.

Chrome Green

Chrome green is the sesquioxide of chromium. It is made by melting together one part of potassium dichromate and three parts of boric acid, then dissolving out the potassium borate, when there will remain the beautiful green powder. It is inert in rubber and is not affected by vulcanization.

Rinmann's Green

Rinmann's green is made in almost any shade of green desired. Chemically it is zinc cobalt oxide and by varying the two metals, different shades are produced. It is made by calcining the precipitate formed when a solution of sodium carbonate is added to a solution containing the sulphates of zinc and cobalt. It gives a fairly good green color in cold cured goods.

Ultramarines

On the border line between the green and blue pigments, we find the very interesting substance known as Ultramarine, existing as a green pigment or a blue one depending on its method of preparation.

No one knows to what it owes its color. It is made by heating to bright redness in a covered crucible for three or four hours an intimate mixture of 100 parts of pure kaolin, 100 of dried codium carbonate, 60 of sulphur and 12 of charcoal. Chemically we should expect such a mixture to give the silicate of sodium, the aluminate of sodium, and sodium sulphide, which might give the whole mixture a brown color, but on the contrary the mass is green and is known as Ultramarine Green. It is a permanent color and is used as an inert pigment.

If this green is powdered, washed with water and dried, then mixed with one-fifth of its weight of sulphur and then gently roasted until the sulphur is removed, and this repeated again perhaps if necessary, the residue will possess a beautiful blue color and as such is known as Ultramarine Blue. This is used in the production of blue rubber articles, tiling, etc.

Acids have the power of destroying both the green and the blue color of these ultramarines.

Prussian Blue

Prussian Blue is made by adding a solution of potassium ferrocyanide to a solution of a ferric salt. The blue pigment formed is filtered, washed and dried. This blue compound will produce a blue stock but not quite as good as ultramarine. It may be used when an acid resistant material is needed and ultramarine cannot be used. On the other hand, however, alkalis will decompose it. Prussian Blue does not withstand the effect of vulcanization as well as ultramarine blue.

Thenard's Blue

Thenard's Blue is made by heating together in a covered crucible aluminum and cobalt phosphates. The blue color which is obtained will depend upon the proportion of aluminum and cobalt used: the more cobalt employed the darker will be the shade of blue. This pigment is not used to any great extent.

In these two sections which, on account of the material they contain appear very choppy, we have tried to give the reader a little insight into these commonest of ingredients used in the rubber industry.

Information Exchange

Measurements of Tire Cores

Inquiry from the A. A. Co., Illinois.—We should greatly appreciate your advising us as to the diameter of tire cores used by the principal tire manufacturers in 1916 and 1917. We would like to have information as to the sizes of cores used in 1912 and what were the principal changes during the period included between 1912 and 1916, particularly with reference to 4½-in. and 5-in. casings.

You do not need to give us complete specifications, but only the outside diameter and the outside circumference of the core.

Lithopone and London Erda Compound

Inquiry from W. O. H. P., Minn.—Will you kindly put us in touch with dealers in lithopone and London Erda Compound? We would prefer dealers close to Minnesota, for we believe New York to be too far away.

Egyptian Cotton in Tires

Inquiry from D. M. T. & A. Co., Iowa.—Can you possibly supply us with a list of automobile tire manufacturers who use Sakellarides cotton fabrics in the construction of their tires?

Digest of the Foreign Rubber Press

***The India-Rubber Journal* (London), December 22, 1917**

Allies and Raw Materials—The sentiment is growing in England that until all the needs of the Allies are satisfied, the Germans ought never to obtain an ounce of raw material out of the Empire. This sentiment has been expressed by Bonar Law, in the House of Commons, and Sir Edward Carson has stated it the policy of the British Government. Commenting on the subject, our English contemporary says:

"We have already pointed out that Germany on the conclusion of war will be an eager buyer, to the extent of her capacity, both of raw rubber and rubber goods. Until she is reprovisioned with raw rubber, both her home trade and her large export trade, amounting in the year before the war to £6,750,000, will be at a standstill. She will be unable to enter into competition with British and allied manufacturers of rubber goods. Not only will this be the case, but large groups of industries for which rubber is a necessity will be to a great extent handicapped in their competition with corresponding allied industries. We owe them no consideration, and would be foolish indeed if we were to permit them to acquire raw materials of which we and our Allies may be in need.

"A question for consideration in this connection is the extent to which it may be advisable to permit Germany to import manufactured rubber goods of British and allied origin. No doubt the sale of such goods would be great, and (after a prolonged experience of the kind of goods now being manufactured and sold in Germany) would greatly enhance the reputation of British and allied manufacturers to the detriment of their German competitors. If Germany is to have either the rubber goods or the rubber, it had better be the former."

***The India-Rubber Journal* (London), December 1, 1917**

Extension of the Employment of Women.—Since the war about 1,421,000 additional females, or 42.5 per cent of the number employed in July, 1914, have been drawn into the various occupations particularized in the statistics compiled by the *Labour Gazette*. If casual laborers in agriculture are excluded, in view of the seasonal nature of their work, the increase would be 1,382,000, or 41.9 per cent of the pre-war numbers. This figure, however, does not represent the net increase in the number of women employed in all occupations, since domestic servants and women employed in very small workshops and workrooms in the dressmaking trade are excluded, as well as women at work in military, naval and Red Cross hospitals. Under this last head there has been an increase in the numbers of women employed equal to 38,000 full-time workers.

On the other hand it is estimated that there has been a displacement of 400,000 women from small workshops and domestic service. Taking these figures together, the net result gives an increase of 1,059,000 women employed in occupations outside their own homes; but it must be borne in mind that a great part of the work previously done by domestic servants who have gone into other employment is now done by unpaid labor.

The relation between the growth in the numbers employed and the numbers replacing men is very different in the munition and non-munition trades. In the metal and chemical trades, in which the volume of work has developed enormously, the increase in the number of women employed is much in excess of the numbers replacing men. The reverse is true in all other industries; that is to say the number of women employed on what was previously regarded as women's work has declined, and the increase in numbers in due entirely to replacement.

Imitation Leather for Switzerland.—Supplies of imitation leather on the Swiss market, and the scarcity of real leather has produced an exceptional demand in that country. French manufacturers are supplying an acceptable quality with a waterproof lining of rubber, but are not now in a position to give good deliveries. Their total output, in fact, comes below Switzerland's present needs in imitation leather. Some of the uses to which the imitation leather is put are drivers' seats, and upholstering of motor cars, upholstering of furniture, cabinets, and baby carriages, and in making school satchels, while heavier qualities are employed in bookbinding.

American manufacturers are said to be making intelligent efforts to establish on the Swiss market a description of imitation leather which is stated to be very superior to the German product. They are endeavoring to equip agents with the necessary catalogues, price-lists and samples. Such agents are expected to undertake the advertising of the goods by the most efficient methods. Trade journals and daily papers are commonly used for such purposes, or in some instances illustrated pamphlets, fully describing the articles, and giving their prices, are distributed among the prospective buyers of a particular line.

Light but strong packing material is essential, and heavy cases should be used only when absolutely indispensable. This is important on account of tariff treatment. Motor car upholsterers ask for antique or Moorish designs. A favorable dimension is 36 ft. long and 4 ft. to 4. ft. 9 in. wide. The price paid per piece varies from $2.00 to nearly $10.00. It is not thought likely that the Swiss boot manufacturers will adopt artificial leather.

***The India-Rubber Journal* (London), January 12, 1918**

British Tire Trade in 1917.—The increased severity of restrictions on the use of gasoline in Great Britain tended to materially reduce the use of pneumatic tires. At the same time the demand for solid rubber tires in War Office service continued to grow. The natural result was that interest was transferred to the solid tire branch of the industry. In fact, practically the only new matter that arose in connection with pneumatic tires was with regard to the use of these on airplanes. In this connection steps were taken with a view to standardization through the Engineering Standards Committee on tire rims.

Standardization of wheel rims and tire bands for solid rubber tires was completed during the year.

A deputation of rubber manufacturers was sent to France to inspect tires in use under war conditions and several matters arising out of this study were dealt with by the Society of Motor Manufacturers and Traders, Limited, and the War Office. The benefits derived from the visit to the battle front proved of advantage both to the War Office and to the tire industry. The number of points dealt with was large, and at the close of the year useful action was still being taken in connection with several of them.

Work was also resumed on the Tyre and Road Wear Research Committee, where, owing chiefly to pressure of war work on the individual members, matters had been in abeyance for a considerable time. This period, however, has not been entirely wasted, as data had been collected with a view to the design of a suitable testing machine, and at a meeting at the National Physical Laboratory, the design of this machine was presented and approved, as was also an estimate of the cost of operating it.

Owing to the steadily increasing cost of production and of raw materials, rubber excepted, pneumatic tire prices were advanced on March 1 and July 23.

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W. I. SEAMAN
TREASURER

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THE RUBBER AGE AND TIRE NEWS

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WHEN the United States Fuel Administrator issued his unexpected order requiring the shut-down of practically every American factory for a period of four working days and further directed that thereafter each Monday in January, February and March should be observed by idleness, practically everybody obeyed. The order was considered a command and the American people without complaint patriotically suffered a tremendous loss. They did not reason; they believed that the sacrifice was necessary; they did not question whether the Fuel Administrator had by any chance exceeded his legal authority.

The law under which the Fuel Administrator has acted was passed last summer and is popularly known as the Lever Law. This law grants the President great powers and authorizes him to fix the prices of coal and coke, and " to establish rules for the regulation of and to regulate the method of production, sale, shipment, distribution, apportionment or storage thereof among dealers and consumers." It also gives him authority to seize plants and name selling agencies. There apparently is nothing in the law to limit the use or to compel non-use of fuel. However, there appears to be no disposition on the part of any one at the present time at least, to inquire into the legal status of the order or to do any act that might in any way jeopardize the successful outcome of the war.

The financial loss that is suffered by both employers and employes must be charged off as one of those sacrifices that must be borne in every war, the patient bearing of which by those at home, helps to make victory the more sure.

An Opportunity—Motor Truck Transportation

The plight of the railroads, which has recently been brought home to all American people in a most forceful manner, should indicate to the manufacturers of trucks and of tires that a great new field may be opening for their endeavors—the supplying of motor transport fleets to relieve the railroad congestion and to give for certain classes of freight more economical and more efficient service that the steam roads have been rendering.

As a commercial venture the proposition of utilizing motor trucks is well worth considering. Capital invested in properly conducted motor truck transportation systems promises to yield a good return.

Long hauls by motor trucks in this country have been made by the Army, by manufacturers and there is one motor transport company that is operating regularly between New York and Philadelphia. That these ventures have not been unprofitable is shown by the fact that they continue in regular operation.

The railroads need relief; the industry of the country demands facilities for carrying its raw materials and for delivering its products. Is there any other solution than the establishment of systems of motor truck transportation? In Great Britain road transport by rubber tired steam and gasoline motored vehicles is almost as important a factor in the industrial life of the nation as railroad transportation, and there are signs aplenty that a similar condition is rapidly approaching in this country.

For transporting and supplying our large armies in the field and in camp, the Government will need thousands of motor trucks. All this means an enormous growth in the demand for solid rubber tires and in this field the rubber industry has a gigantic task before it.

Some rubber companies are successfully operating motor trucks on long hauls for their own needs. This is a move in the right direction, and the day may not be far distant when the movement will be more general, and when manufacturers in different lines will co-operate in a more general effort to improve transport facilities.

Sunlight and Cheer

It costs money to keep windows clean, but clean windows add to cheerfulness and production. Perhaps some of the big rubber companies with their large corps of efficiency experts can tell just how dirty it pays to have factory windows, can figure down to a fraction of a cent how much soap, water and " elbow grease " it costs to keep each window clean and how much coal, labor, wear and tear and replacement it takes to illuminate the space that the dirty windows should light.

The efficiency engineer, however, has difficulty in accurately estimating the satisfaction that the workman obtains—even if he does not show the appreciation—from working in a pleasant factory. A person easily becomes accustomed to conditions that are not ideal, and much good work is done under surroundings that are not pleasant, but it is safe to say that in most cases, the better the conditions the better the work.

The employment department of a rubber works is always anxious that the factory be as inviting as possible; the superintendent prefers to hold his help rather than to break in new or " green " hands.

Clean windows, bright sunlight and pleasant surroundings help to make for cheerfulness and induce workmen to become interested. The interested employe is the one whose services are the most valuable; he is the most desirable one to retain.

The Crude Rubber Situation*

Undoubtedly the principal events of the year have been the entry of America into the great war, and the dropping out of Russia. America will probably always be the greatest rubber manufacturing nation of the world, and her entry into the war has already had a very pronounced effect in many directions. The rubber manufacturing concerns of America have responded to the national call, and many of the technologists and workmen are for the time being not concerned purely in matters of rubber manufacture. The productive capacity of America so far as rubber goods are concerned has, therefore, been very appreciably affected.

The Russian position has further introduced an important factor, since the supply of raw and manufactured rubber to that country are for the time being practically suspended. In addition, there has been, voluntary or otherwise, a reduction in the private consumption of rubber articles in England and in practically every other country of the world. The cumulative effect on the tire trade alone of recent British Government instructions is bound to be very great. Further, we have to bear in mind that the year 1917 was one in which considerable raw and manufactured rubber was sunk, and the cargo space available for our commodity reduced. It is more than likely that the year before us will see further restrictions of tonnage for rubber, and for that reason alone no one need be surprised to learn that the growers of rubber propose, according to the statements which have already appeared in the press, to restrict production of plantation rubber, in order that more freight will be available for other purposes.

Production of Rubber

It is of course impossible for us to give, at present, a statement of the production or consumption of rubber throughout the world for 1917. We think, however, that an approximate estimate of a crop of 200,000 tons of plantation rubber is near the mark. Under normal circumstances the production of plantation rubber during the current year would have been something like 250,000 tons. In view, however, of the necessity of reserving freight for articles other than rubber, and the contemplated reduction in output, a figure of 200,000 tons will, in our opinion, be a safe basis to work upon for 1918. A great deal must of necessity depend upon the unanimity with which the Government and private proposals with regard to the reduction of output are received. The amount produced on plantations will not represent the amount delivered to the consuming countries, but it is impossible at this stage to give a forecast of the reduction which will be made through losses at sea.

Capital Issues and Taxation

The Treasury restrictions with regard to the issue of capital have been fairly well observed by manufacturing and plantation companies throughout the year. With one notable exception, there has been no large issues of new capital by manufacturers, the majority having found it possible to continue with very slight variations in the capital of their concerns. The same may also be said of plantation companies. There have been several registrations during the year, but these have been by way of conversion from foreign companies into English companies, and have represented more or less a mere exchange of shares. In one or two cases plantation companies have found it necessary, in order to continue ordinary cultivation and necessary extensions, to obtain further capital by way of loans or the issue of options or option shares. In most of these instances the moneys advanced are to be satisfied after the war by the issue of ordinary shares or debenture stock.

A difficulty has been experienced by a number of plantation companies in connection with the exercise of options issued long before the war, and also in the conversion of debentures into ordinary shares, the right of conversion having been granted many years ago, when the debenture issues were made. The companies have been compelled to accept conversions of options or debentures into shares, but difficulties have been placed before those who wished to deal in such converted or exercised shares on the market.

Excess Profits Tax

The old decision of the Board of Referees still applies with regard to rubber planting companies, but in consequence of a somewhat animated controversy rubber growers have undertaken to make a further appeal for an increased rate to be allowed them. While we believe that rubber plantation companies are asking for only what is their due, we cannot agree that they have the public behind them. The public does not understand the position, because it has not been told. The case for an increase in the percentage standard will be heard at an early date. Meanwhile plantation companies operating in the Dutch West Indies have received notice of their liability to pay Excess War Profits to the Dutch Government in Holland, and also in the Dutch East Indies. The assessments payable in Holland have been received in this country with some little surprise, and so far we have not heard of any particulars being forwarded from Holland to companies in London explaining the manner in which the assessments have been arrived at. Only those companies having their registered offices in Holland are of course liable to the Dutch War Tax; only a small number of British owned plantation companies are so situated. On the other hand, there are many companies registered in London owning land and estates in Sumatra, Java and Dutch Borneo; these become liable to the Netherlands Indies War Profits Tax issued in October, 1917. We gave, in our last issue, particulars of this enactment. There is a well-founded belief that any Excess Profits Tax payable in this country or in Holland will be deducted from the profits before liability to assessment in the Dutch East Indies takes place. On the whole, however, plantation companies registered in the Dutch East Indies are liable to heavier payments towards the various War Profits Taxes than are those operating in British possessions.

Rubber Prices

The year has provided a record of variation for plantation rubber in the East, London and New York. Owing to the scarcity of freight from the East to this country, considerable business has been done in raw rubber at various Eastern centers. Growers have been faced with a most difficult position, having found it impossible to ship a large proportion of their crop to this country. The American dealers have therefore been able to take advantage of the position, and have done much business in the East rather than in London, since they were sure of getting large supplies of rubber at comparatively low prices.

First grade rubber has been sold during the year in the East at 1s. 9d. per lb. at a time when the price for the same quality in London was 2s. 4d. per lb. That fact alone is a fair indication of the market position, and of the big sacrifices which many plantation companies have had to face. The average prices realized during the year for various plantation grades have been much lower than those of a year ago. The full effect of the lower range in prices will not be appreciated to the full until the various plantation companies publish their accounts for the year 1917. We have given timely advice to those interested in plantation companies not expect the same profits for 1917 as were obtained for 1916. Furthermore, we do not see much likelihood of prices being materially raised in the East except production is very seriously curtailed. London seems likely to receive still less rubber from the East, and the disparity between prices of the same grade may become even more pronounced than it has been.

The market in forward rubber is not at the moment a very large one, and it should be clearly recognized that only a very small proportion of the output for 1918 has so far been sold. This is a position which makes the market a very speculative and on the whole a weak one. There has been an increase in the amount of business done ex warehouse in the East, a fact which indicates that ordinary growers do not care to be troubled with the arrangements regarding shipping, though dealers are evidently prepared to find some way out of the difficulty, providing there is some small discount off the price paid for material.

Planting Developments

The most noteworthy development during the year has been in connection with diseases. Scientific officers are by no means too plentiful in the East, and it is to their credit that they have been able to give publicity to many diseases which were not regarded seriously even twelve months ago. New diseases, such as the "Brown Bast," "Poria," etc., are being tackled almost from their first appearance, and some very practical suggestions have been put forward by the scientific officers and the planters to combat these new fungi or algae, and others which have shown activity. We have no doubt in our minds that the majority of plantation owners realize the gravity of the position and are alive to the fact that diseases are going to play a much more important part in the production of raw rubber than any other factor, excepting labor. We have seen the accounts of various estates, and we are sure that the ordinary public investor has no conception of the extent to which diseases had taken hold of many plantations.

There has been quite a marked activity by managers in the removal of branched and logs of wood on estates, and the uprooting of stumps, it having been clearly proved that this dead material is a source of considerable trouble, and that diseases and pests are less rampant where all such loose timber and roots have been removed.

Tapping has also undergone some change for the good, the tendency having been to tap only one cut instead of two,

* From the India Rubber Journal, Jan. 5, 1918.

though the daily system as against the alternate day system of tapping seems to be still more popular.

The prices of coagulating materials, especially acetic acid, have continued to rule very high. Acetic acid, now obtainable only under license, is particularly expensive. Many of the utensils used in storing and coagulating rubber are almost unobtainable; enameled collecting dishes, for instance, are almost impossible to procure. Disinfectants, fungicides and wood preservatives are still very much in demand, and are very necessary for the life of any tropical plantation. The Government has prohibited the export of many disinfectants, owing to their containing particular ingredients. We hope, however, that the Government is fully alive to the urgent necessity of supplying all tropical areas with abundant material to keep diseases, affecting plants and human beings, in check.

Machinery has given considerable trouble on the majority of plantations, but the position has been relieved to some extent by the enterprise of a number of local firms in the Middle East. Orders placed for this machinery in this country two years ago have not yet been executed, and it seems likely that all apparatus of which steel forms an essential part will not be satisfied until the war is over.

The absence of new companies and the difficulties placed in the way of those who would desire to raise capital for plantation work have been reflected in the paucity of extensions made in the planted area during the year. The total planted area throughout the East is approximately 2,000,000 acres. Very few additions have been made during 1917, the more important ones being in Sumatra and Java. The slight increase in acreage in various countries during the year is offset to some extent by the number of trees destroyed by disease, windstorms, and other usual causes.

A review of the principal events of the year in so far as they affect the rubber industry would be incomplete without some reference to the personal loss which every department of our important trade has suffered through the war. Almost every section of the industry has a long list of men who have been severely injured or who have made the supreme sacrifice. Furthermore, as the months have rolled by, the demand on the remaining men in the various concerns has been increased, and we feel quite sure that our particular trade has been fairly well denuded of men, and that those who remain will be called upon to continue working at an even higher pitch during the present year.

Review of the 1917 Crude Rubber Market

In the annual review of the crude rubber market issued by S. Figgis & Co., crude rubber brokers of London, England, are printed some very interesting statistics and statements. The salient points of this review follow:

American consumption showed a very substantial increase, which, though partially due to the needs of war, can be chiefly attributed to the abounding prosperity in the New World and the universal use of motor vehicles for both pleasure and commercial purposes.

The supply from the East increased more than one-third over 1916, and must show further increase in 1918. For 1917 we estimate that 220,000 tons of the world's total output crude rubber came from the Eastern plantations.

During the first half of 1917 prices were favorable for sellers. The year began with pale crepe at 3*s.*, and as high as 3*s.* 5*d.* was paid in February. Then prices declined until 2*s.* 5*d.* was accepted in June. The year closed with rubber at 2*s.* 6¼*d.*

There was again considerable speculation by outsiders in England in the last half of the year, with an endeavor to push prices up on account of the scarcity of ocean freight to that country; fear of torpedoes, and the fact that rubber is one of the few articles of production that is not at a high price. This attempt was entirely unsuccessful, and accounted for the price of 3*s.* 0¾*d.* being paid for forward delivery in the early autumn, and was largely responsible for spot and near delivery being sold down to 2*s.* 2½*d.* during the past few weeks, and has accounted also for the large fluctuations recently.

The world's visible supply is believed to be now fully 20,000 tons over last year. Considerable forward contracts for 1918 have been entered into c.i.f., f.o.b. or ex godown (warehouse) in the East, and sales are made regularly to American Pacific coast ports.

Complaints of quality and claims have decreased, showing the great care exercised by estate managers in preparing and shipping rubber.

The supply from Brazil was well maintained; Central American sent little rubber, and practically no Guayule came from Mexico. Wild rubbers did not increase; the West Coast of Africa showed a decrease in its shipments; very little came from the East Coast of Africa and Madagascar.

The British and French motor vehicle industries were much hampered by the large number of men and works that were taken over by their respective governments for munitions work. This caused a falling off in the production of pneumatic tires. The production of solid rubber tires increased very substantially.

Thinning Out on Plantations

Thinning out is wisely in progress on many plantations, so that the actual number of trees to be tapped in 1918 may not be so large as anticipated. But, at the average rate of progress, the supply for 1918 must be large. There are also reports of a suggested combination of growers to limit tapping.

Sorting and Packing

Small lots are not liked and shipments should be sorted into as few piles as possible. Packing should be carefully done and the rubber laid as flat as possible, especially the sheets, which should not be folded. The packing cases should be strong, the 150-pound size is useful, and they should be planed smooth on the inside. There have been complaints occasionally of broken weak cases, and consequent loss to buyers.

Plantation Rubber Shipments

The following table shows estimated shipments of plantation rubber for the years 1910 to 1917 inclusive:

	1917	1916	1915	1914	1913	1912	1911	1910
Exported from Ceylon and India .....*tons*	*25,000	23,500	20,600	14,800	11,830	6,300	2,750	1,430
Exported from Malaya, etc.	146,000	102,000	72,800	49,700	36,200	22,200	11,400	6,800
Totals	171,000	125,500	93,400	64,500	48,030	28,500	14,150	8,230

* Direct Dutch shipments are not included in these figures, but they probably amount to less than 20,000 tons.

The Brazilian Supply

The Brazilian supply showed an increase as was anticipated. The total receipts in England from this source including Amazonas, Bolivia, Peru, etc. were as follows: In 1917, 41,500 tons; in 1916, 36,500 tons; in 1915, 37,500 tons; in 1914, 37,000 tons; in 1913, 39,000 tons; in 1912, 40,500 tons; in 1911, 39,500 tons.

Planting

It is believed that any planting which there may have been in 1917 has been partly counteracted by the falling out of cultivation, and thinning out of some of the previously planted areas.

The plantations, principally of Castilloa, in Mexico, the West Indies, and Central and South America, have not progressed; their output was insignificant.

India, Burmah and the Mergui have increased and are extending, but the Ceara plantations in East Africa sent scarcely any rubber to the London market.

World's Supply (Estimated)

Amazonas and Brazil.....*tons*	41,500
West African (a little direct to U. S.)	6,500
Mattogrosso, Manicoba, Assare, etc....	1,000
East African, Manihot, etc., Penang, Borneo, Rangoon, Assam, Madagascar, etc.	900
Central America, Mexican, etc.....	600
Plantation Malaya, Ceylon, India and Dutch E. I.	190,000
Guayule .....Almost	Nil
	240,500

Total for 1916 was (under) estimated at 178,000 tons.

World's Consumption (Estimated)

England .....*tons*	26,000
Germany, Austria, etc.	1,000
France	10,000
Russia	7,000
Italy, Spain, Scandinavia, etc.....	5,500
Japan and Australia.....	5,000
America and Canada.....	155,500
	210,000
Stocks: England, Russia, (East) America and Eastern Shipping Ports, say	17,500
Afloat, say	13,000
	240,500

Total for 1916 was (under) estimated at 178,000 tons.

Many of the figures have had to be estimated as reliable information has not been available since the beginning of the war. All figures are net weights.

Garber with Hood Rubber Co.

Harry D. Garber's many friends in the rubber industry, will be pleased to learn that he is now superintending the heel department of the Hood Rubber Co., Watertown, Mass. Mr. Garber has a long and successful experience in the making of molded rubber goods. He started with the Diamond Rubber Co., Akron, Ohio, and spent nine years in the mechanical goods and sole and heel departments of that company. From the Diamond he went to the Goodyear Tire & Rubber Co., where he was three years in charge of the sole and heel and molded goods departments. Coming East, Mr. Garber met with further success in managing the same departments of the Plymouth Rubber Co., Canton, Mass., and no doubt he will prove a valuable addition to the forces of the Hood Rubber Co.

Minto in Charge of Carlisle's Frisco Branch

C. H. Minto is now Western District Manager of the Carlisle Cord Tire Co.

Some Rubber Trade Activities

War Service Committee—Exempts Some Rubber Factories—U. S. Rubber Co. Combines Sales——Secretary Baker's Explanation on Gas Masks

War Service Committee of the Rubber Industry of the U. S. A.

The Rubber Association of America, realizing the importance of rubber products as necessities of the first order in the successful prosecution of the war, and being desirous to do all in its power to bring about the most effective cooperation with the Government, with the authorization of its Board of Directors, has appointed a War Service Committee to represent all rubber manufacturers of the country and their allied industries in their relations with the Federal Government during the war.

Similar committees have been formed by many of the other large groups of industry in the country. The Committee appointed by the Rubber Association is known as the War Service Committee of the Rubber Industry of the U. S. A., and is made up as follows:

Bertram G. Work, chairman, president, the B. F. Goodrich Co., Akron, Ohio; Harvey S. Firestone, president, the Firestone Tire & Rubber Co., Akron, Ohio; James N. Dunn, president, U. S. Tire Co., New York City; George B. Hodgman, president, Hodgman Rubber Co., Tuckahoe, N. Y., and Paul W. Litchfield, vice-president, Goodyear Tire & Rubber Co., Akron, Ohio.

Some of the functions of the Committee are as follows:

To act as a point of contact between the rubber industry and the Government. To assist the Government in supplying information as to the capacity of the industry to serve the needs of the Government in carrying on the war. To supply statistics of all kinds. To cooperate in the standardization of specifications and products for Government use. To assist in the efficient and speedy production of the Government's requirements. To put before the Government the needs of the industry at all times.

In order to carry out these functions, sub-committees will be formed, representing the various branches and problems of the industry, among which will be the following:

Pneumatic Tires.
Solid Rubber Tires.
Mechanical Rubber Goods.
Medical Rubber Goods.
Rubber Boots and Shoes.
Clothing.
Air Craft.
Gas Defense.
Reclaimed Rubber.
Hard Rubber Goods.
Crude Rubber and Kindred Products.
Foreign Trade.
Supplies.
Statistics and Reports.

There will be technical committees as well as commercial committees on most of the various sub-divisions, to insure the best representative ability of the industry being brought to bear on all problems.

The headquarters of the War Committee of the Rubber Industry of the U. S. A. will be in the offices of the Rubber Association of America, 17 Battery Place, New York City.

Thornton Taking Over New Plant

The Thornton Rubber Co., Oshawa, Ont., is reported to be planning to take over the plant of the Ontario Malleable Steel Range Co., Oshawa, and to equip it for the production of rubber goods.

Baker Explains Return of U. S. Gas Masks

Secretary of War Baker authorizes the following explanation of the return from the battle front of gas masks of American make:

"Various newspapers during the past ten days have printed a statement that 200,000 gas masks, made in this country and shipped to General Pershing, have been returned to the United States, 'being absolutely worthless for the purpose for which they were intended.' It is due the parents and the relatives of the men who will use gas masks that the facts be known.

Why They Were Reshipped

"Our experiments in the United States for devising a gas mask superior to any previously used have been constant and gratifying. Previous to Jan. 1, 1918, only 20,000 masks had been shipped from this country to Europe. Before these masks were issued to our troops in France, very marked improvements were perfected here, and General Pershing was cabled that a superior mask would soon be manufactured. He was asked to return the masks then on hand, for training purposes here. General Pershing procured from British sources sufficient masks to completely equip his forces, pending the arrival of the newly devised models.

British Indorse New Models

"The perfected masks now being shipped to General Pershing have not been commented upon by him as yet, nor has there been time for an actual test of these masks in battle. However, after exhaustive tests made in this country, British experts have testified that the masks give better protection than any now being used by the allied troops.

"The returned masks, which are now being used solely for training soldiers in this country, will not withstand the heavy concentrations used in actual gas attacks in Europe, but they afford perfect protection against the gas clouds used in training in this country. Being of the same general type, however, as those now being sent to Europe, they serve to familiarize the men with the use and operation of the masks with which they will be provided on the firing line."

Garfield Exempts Some Rubber Factories

United States Fuel Administrator Garfield gave out on January 18 a list of industrial concerns which had been exempted from the operation of the order curtailing the use of coal. The list was compiled on information furnished by the Secretary of War, the Secretary of the Navy, and the heads of other Government departments. About 1000 plants were included, insuring work to hundreds of thousands of men.

The concerns were exempted only insofar as they were operating on the articles specified in the list and were forced to shut down other departments. The following rubber manufacturers were affected:

The B. F. Goodrich Co., Akron, Ohio;

Goodyear Tire & Rubber Co., Akron, Ohio;

Mechanical Rubber Goods Co., Cleveland, Ohio;

C. Kenyon Co. Brooklyn, N. Y.

All these companies were exempted to allow them to continue to manufacture gas masks of the box respirator type.

Combines Sales of Seven Rubber Companies

An important development in the rubber trade came with the announcement by the United States Rubber Co., System, New York, that it had centralized the selling forces of all its subsidiary companies manufacturing rubber mechanical goods in one organization. The change involves the Revere Rubber Co., Chelsea, Mass., and Providence, R. I.; the Peerless Rubber Manufacturing Co., New York; the Mechanical Rubber Co., Cleveland, Ohio; the Mechanical Rubber Co., Chicago, Ill.; the Sawyer Belting Co., Cleveland, Ohio; the India Rubber Co., New Brunswick, N. J., and the Eureka Fire Hose Manufacturing Co., New York.

The consolidation will make possible a more efficient and expeditious service to the public. In addition to centralizing the selling forces, the re-organization will coordinate production. Headquarters for both the distribution and production organizations will be in the United States Rubber Building, 1790 Broadway, New York City.

It is said that the United States Rubber Co., System, under the new plan of merchandising, will be able to offer a more complete line of rubber mechanical goods than has ever before been placed on the market under a single brand. The new selling organization will be known as the United States Rubber Co., Mechanical Goods Division. Specialized mechanical rubber goods branches will be operated in all the principal cities.

The subsidiary companies will continue to manufacture the brands of rubber goods that have made them famous, but all their products will bear, in addition to the old brands, the identification seal of the United States Rubber Co.

Rubber Men and the Coal Order

Opinions in industrial and commercial circles varied somewhat as to the effect of the Garfield closing edict. Below is given the opinion expressed for publication by Col. Samuel P. Colt, president, and Frederick C. Hood, vice-president, Hood Rubber Co., Watertown, Mass., the United States Rubber Co., System, New York. Colonel Colt said:

"In this company steps have been taken to comply as specifically with the order of the Fuel Administrator as possible, without actual destruction and loss of valuable product in process.

"We know nothing of the immediate exigencies that face the administration for promulgating this far-reaching and drastic order. We all agree that the needs of individual manufacturers and business houses must be subordinated to the greater national need at this time, but we could have wished that these specific provisions of the order had been made coincidently, so that the interpretation of the spirit and intent would have been simpler without bringing any great hardship on the many thousands of employees and direct loss to manufacturers from the necessity, in certain industries, of closing abruptly, rather than after due notice.

Frederick C. Hood declared: "The order is nothing short of a calamity. Of course, this is war and we must obey. Still, it appears that we are receiving arbitrary orders from persons who have not studied all issues."

Royle Issues New Calendar

John Royle & Sons, Paterson, N. J., manufacturers of tubing, insulating and straining machines, have issued a new calendar showing their motor-driven tubing machine.

Notes of Interest to the Rubber Industry

Plan to Curtail Rubber Production—Todd Companies Merged—Farewell Dinner to T. A. Forsyth—Goodyear's Metallic Shoe Men in Army—R. M. Lowenthal to Increase Capital

A Step to Curtail Plantation Rubber Production

The Rubber Growers' Association, London, an organization representing all the leading crude rubber growers of the British Empire, has communicated to The Rubber Association of America, a circular which it has addressed to all producers of plantation rubber. A copy of this circular is here reprinted.

In a letter to Harry S. Vorhis, Secretary of The Rubber Association of America, A. C. Read, Acting Secretary of the Rubber Growers' Association, explains his association's step to curtain the output of plantation rubber during 1918, and states that the sole reason actuating the Council of the Rubber Growers' Association in the action it has taken is to endeavor to prevent an undue accumulation of rubber at the ports of shipment in the Middle and Far East.

Mr. Read states that it is estimated that, notwithstanding any regulation of output, an ample supply of crude rubber will be available for all requirements having in view the modified nature of the demand which is bound to arise from the restrictive action of the Allies.

The following is a reprint of the Rubber Growers' Association's circular to crude rubber producers:

THE RUBBER GROWERS' ASSOCIATION, INC.

CIRCULAR TO ALL PRODUCERS OF PLANTATION RUBBER

Dear Sir(s),

His Majesty's Government and Allies are insisting upon a minimum consumption of all seaborne commodities.

At the recent Inter-Allied Conference in Paris the Imports, Maritime Transports and Supplies Section decided to create an organization with a view (inter alia)—

"To restrict imports in order to release as much tonnage as possible for the transport of American troops."

The concrete effect of this decision has yet to be realized, but the Council feel strongly that it is the urgent duty of the Association to support the Governments in their policy of releasing tonnage for the conveyance of food and troops. It is felt that voluntary action now upon the part of producers may avoid more drastic measures by the Allied Governments, and the Council desire to impress upon the members of the Association and upon rubber growers in general, the urgent need of co-operative action.

The unanimous decision of the Council is that the crop to be collected in the year 1918 should be limited to 80 per cent. of that collected in 1917, or in any previous year showing a greater yield, the method of effecting the reduction to be settled individually by proprietors according to the particular conditions of each estate.

In order to meet the case of the young producers, as well as estates giving a low average yield, 200 lbs. per acre in bearing during 1918 is to be taken as the standard yield below which no reduction will be required.

You are requested to signify your assent to the proposal by forthwith returning to the Association the attached form duly filled up, and at the same time instructing the managers of your estates to give immediate effect to the reduction agreed upon.

Yours faithfully,
A. C. READ,
Acting Secretary.

Todd Companies Merged

A certificate of consolidation has been filed by the Todd Rubber Co. of New Haven, The Todd Rubber Co. of London and the Todd Rubber Co. of Waterbury, to be known as the Todd Rubber Co. of New Haven. The directors are Eyler J. Todd, New Haven; J. L. Todd, New Haven, and Frederick H. Potter, Waterbury, Conn.

Farewell Dinner to T. A. Forsyth

On Dec. 27 the old-time employes of the Boston Belting Co., Boston, Mass., gave a dinner to Thomas Alexander Forsyth, the last of the Forsyths connected with the company, on his retirement. A large and

LOVING CUP PRESENTED TO T. A. FORSYTH

appropriately inscribed loving club was presented by R. B. Adams, superintendent of the mill, on behalf of the old-timers.

Mr. Forsyth, in a moving acceptance of this token of esteem, spoke forcibly upon the loyalty of all the men who had worked so closely beside him during his fifty-one years from office boy to president. Mr. Forsyth gave a brief outline of the early struggles in making rubber goods and mentioned that the Boston Belting Co. was the oldest rubber concern in existence. The Hancock Co. of England was just one year behind.

He recalled going to school and living in Roxbury where the factories are now located, and the many adventures of fire and flood that he and his brothers overcame. He also brought to mind how the heavy iron rollers for paper making machines were made in Bridgewater and carted to Roxbury by ox teams for covering with rubber at the mill.

Names like Goodyear, Haskins, McBurny, Durant, Cheaver and Converse were all associated with the early days of the Boston Belting Co.; in fact, Mr. Forsyth remarked that practically every rubber company in existence in this country today were offshoots from the original company at Roxbury. Moreover, James Bennett Forsyth, the predecessor of Thomas, was the inventor of most of the rubber machinery in use today, which has remained practically unchanged since the final improvements made under this brilliant genius.

Mr. Forsyth said that he felt that the loving cup just presented was the greatest tribute he had ever received because he knew that it came from the hearts of the men who had worked hand in hand with him for so many years. It may not be out of place to mention the names of some of these old-timers who are still proud of their connection with the Boston Belting Co., and of whom the retiring president spoke in such glowing terms. They are:

E. S. Norris, 52 years of service; John Krebs, 45 years; Rufus Dalton, 44 years; James Muldoon, 44 years; Horace Dyer, 38 years; C. G. Russell, 36 years; Sherman Smith, 35 years; Charles Kreger, 35 years; George Crouch, 33 years; Thomas Grier, 33 years; Daniel O'Brien, 32 years; Thomas Connolley, 30 years; Robert Dolan, 30 years; Edward Harkins, 30 years; Robert Jeffers, 30 years; Edward Devine, 30 years; Charles Haigh, 30 years, Frank Holt, 20 years; Thomas Dudgeon, 30 years; Harry Elder, 30 years; James McGrath, 28 years; Melbourne Tewksbury, 25 years, John Muldoon, 25 years; John Willis, 25 years; William Hesford, 25 years; Frank Cameron, 23 years; William Pottle, 23 years; R. B. Adams, 22 years.

Not all the charitable activities of "T. A.," as he is affectionately called, will be known. Forsyth Street, off Huntington Avenue in Boston is named after him. The beautiful, modern, fully equipped Forsyth Dental Infirmary was his gift to the City of Boston. "T. A." is also a trustee of the Boston City Hospital and the Forest Hill Cemetery.

Mr. Forsyth will devote his energies and interests to the above mentioned institutions and there is no doubt that he will continue to dispense much good for the welfare of the City of Boston.

The evening passed with music, song and story telling. About seventy were present in the old directors' room. Some of those old-fashioned reminiscences were indeed worth listening to.

R. B. Adams, Frank Cameron, George Ellinwood and E. L. Tewksbury had much to do with making the pleasant, though touching evening, so pronounced a success.

Goodyear's Metallic Rubber Shoe Men in Army

The Boot Repairing Unit of the Quartermaster's Corps at Camp Meigs, Washington, D. C., boasts of several former members of the Goodyear's Metallic Rubber Shoe Co.'s force. Samuel W. K. Allen, Jr., formerly of the receiving department of the well-known Naugatuck plant, has been appointed as a Lieutenant of this unit, and among the enlisted men are Harold L. Goodwin, formerly of the office department; Alfred C. Green, ex-foreman of the stitching department; Lloyd H. Lehmer, formerly of the laboratory; Shirley E. Culver, who as a civilian was in the packing room, and Thomas Brooder, a former member of the shoe making department.

Clarence M. Rupp, of the Goodyear's Metallic Rubber Shoe Co., has enlisted in the U. S. Naval Reserves in New Haven, Conn.

R. M. Lowenthal & Co. Increase Capital

R. M. Lowenthal & Co., 51 East Forty-second Street, New York, dealers in scrap tires and tire scrap exclusively, have increased their capital stock from $200,000 to $250,000, to provide for more extensive operations.

R. M. Lowenthal & Co., recently purchased the building and property at Babcock and McKinley Streets, Buffalo, N. Y., which they now occupy. This plant is located on the Pennsylvania Railroad, has a private siding for seven cars and is equipped with the most modern and complete facilities for handling scrap tires and tire scrap. The building has some 80,000 square feet of floor space, 40,000 square feet of which represents ground floor space. There are also 40,000 square feet of open ground space, making this plant probably the largest devoted exclusively to scrap tires and tire scrap.

Important Trade Happenings

U. S. Chamber of Commerce Strongly Urges the Creation of More Adequate Central Control of War Efforts—The Rubber Footwear Situation

Urges Further Centralization of Control

In a carefully prepared statement, the United States Chamber of Commerce urges with the strongest emphasis the creation of more adequate central control of war efforts, and points out that the newest plans of the Government are tending toward decentralization.

The failure to be guided by the fundamental principle that centralized control is needed for the success of any enterprise, says the statement, will bring about unintentional interference with vitally important programs, such as that in connection with shipping; there will be production far beyond our capacity of ocean transportation; our allies will be deprived of supplies which we should desire to give them; effort will be expended in the creation of unneeded new facilities; collateral problems, such as the housing of employes will be neglected until they seriously interfere with other programs; the distribution of essential materials, such as coal, will not be where most needed in connection with the war; vast quantities of material and labor will be used in unnecessary activities, and, in general, there will be the atmosphere of confusion, which comes from inability to secure prompt decision.

The action of the board of directors was based on a report of the War Committee, which is composed of Waddill Catchings, chairman, president, Sloss-Sheffield Iron & Steel Co.; William Butterworth, president, Deere & Co.; John H. Fahey, publisher and manufacturer; Homer L. Ferguson, president, Newport News Shipbuilding & Dry Dock Co.; Charles Nagel, former secretary of Commerce and Labor; Lewis A. Pierson, chairman of the board, Irving National Bank, and Harry A. Wheeler, vice-president, Union Trust Co.

The committee has been at work since June, and although concerned over the delay in the effective development of the centralized system of control, it refrained from making a report until it felt that instead of the War Industries Board becoming a body with more centralized powers was to be made only a coordinating body or clearing house.

The Rubber Footwear Situation

At the annual meeting of the National Association of Shoe Wholesalers, held recently in Boston, Mass., George H. Mayo, Manager of the Footwear Division of the United States Rubber Co., System, New York, explained the peculiar circumstances under which all orders for rubber footwear had been cut down and how the total output of the ten corporations manufacturing "rubbers" in the United States would be distributed. He told how the problems of labor and the shortage of raw materials resulted in a restriction of manufacturing long before the United States entered the war.

The United States Rubber Co. has made an estimate of its probable production for 1918 and had notified its customers that the output would be prorated and distributed according to the purchases of the jobbers in previous years. Soon after this, however, the United States Government had called together the representatives of the ten rubber footwear manufacturers and demanded that they state the daily capacity for production of their mills. The daily output was then multiplied by the number of working days in the year and the grand total compared with the Government's requirements for the ensuing twelve months. The amount of production in excess of the Government's demands was then released for sale for civilian consumption.

This action compelled the rubber companies to again prorate their sales to the wholesale trade which in turn will be obliged to distribute "rubbers" to retailers on the same basis of restriction. The total output of rubber footwear during 1918 was fully preempted in this manner, and neither the rubber companies nor the jobbers will have anything for sale beyond the limited apportionment to regular customers in the manner described.

Condon and Vaughn to St. Louis

Martin Condon, of the cutting room of the Goodyear's Metallic Rubber Shoe Co., Naugatuck, Conn., has been transferred to the St. Louis, Mo., plant of the same company.

C. W. Vaughn, formerly in the office of the Goodyear's India Rubber Glove Manufacturing Co., Naugatuck, has also been transferred to the St. Louis factory where he will work in the cost department.

These two transfers were made in keeping with the United States Rubber Co.'s policy to advance men wherever possible instead of bringing in men from the outside to fill vacancies.

Cummings Joins Timkin Roller Bearing Co.

Arthur H. Cummings has resigned his position as assistant advertising manager with the B. F. Goodrich Co., Akron, Ohio, and is now connected with the Timken Roller Bearing Co. as advertising manager.

Rubber Companies Expanding

General Builds Addition—Devine Enlarges Plant—Premier Receiving Bids—Gillette Plans Addition—Ardmore Akron to Build

Rubber Companies Expanding

According to reports the Trenton rubber business is unusually active. Rubber factories have been working night and day with the demands for their products.

The Empire Tire & Rubber Co. is expending $220,000 to double the output of its auto-tire and mechanical plant. Of this sum $180,000 is being spent for machinery and $40,000 for new buildings.

The De Lion Tire & Rubber Co. is making additions costing $100,000. Within the next month its output will amount to 1000 tires a day.

The Zee Zee Rubber Manufacturing Co. of Yardville, N. J., a suburb of Trenton, is expending $500,000 for the construction of a new brick and concrete building.

General Building Addition

(Special Akron Correspondence.)

The prediction of General Tire & Rubber Co. officials that their business will increase at least 40 per cent next year seems to be well founded in fact.

A new addition is being built to the factory, 80 x 100 ft. in extent. When finished it will house department No. 5. When in operation the expanded department, which now wraps and sends out 1000 new tires daily, will be able to handle 40 per cent more business.

Addition to McLean Plant

The McLean Tire & Rubber Co., East Liverpool, Ohio, has completed an addition to its factory The new building, which is 80x150 ft., will be used as a mill and stock room. The company is now devoting itself exclusively to the production of its "Champion" non-skid tire. The present output is 300 tires per day, which the company expects to increase to 500 after the first of the year.

Devine Enlarging Plant

The J. P. Devine Co., builders of vacuum driers, Buffalo, N. Y., has awarded the contract for a one-story addition to its foundry to cost approximately $5,000.

General Chemical Building New Factory

The General Chemical Manufacturing Co., Camden, N. J., has awarded the contract for the construction of a one-story service building in that city.

Premier Receiving Bids for Factory

The Premier Rubber & Insulation Co., Domestic Building, Dayton, Ohio, is receiving bids for a one-story 50 x 102 ft., the estimated cost of which will be $25,000.

Gillette Plans Additions to Plant

The Gillette Rubber Co., Eau Claire, Wis., is planning the construction of an addition to its plant.

Sprague Awards Contract for Factory

A contract for the construction of a three-story 140 x 142-ft. factory has been awarded by the Sprague Tire & Rubber Co., 1102 Woodmen of the World Building, Omaha, Neb. The cost of the new building is estimated at $200,000.

Ardmore Akron to Build

W. S. Emerson, architect, Ardmore, Okla., is preparing plans for the construction of a 100 x 300-ft. factory building for the Ardmore Akron Tire & Rubber Co. of that city. The new building will cost $60,000.

Russell Plans Factory

The Russell Tire Co., Newark, N. J., recently incorporated for $100,000 capital stock, is reported to be planning to build a factory.

Akron Tire to Enlarge Plant

The Akron Tire Co., Honeywell Street and Skillman Avenue, Long Island City, N. Y., has had plans prepared by Stines & Ludwig, architects, 9 Jackson Avenue, Long Island City, for the construction of a one-story 50 x 95-ft. factory, to cost approximately $12,000.

Doss to Build Factory

The Doss Rubber & Tube Co., Atlanta, Georgia, plans to build a one-story 55 x 140-ft. brick and stone plant at McPherson, Ga., for manufacturing automobile tires.

Republic to Add Large Building

The Republic Rubber Co., Youngstown, Ohio, is having plans prepared for the construction of a three-story factory building, to cost $300,000, according to the estimate.

Items of Interest to the Rubber Trade

Racine Gives Banquet—Pearce Stockholders Hold Annual Meeting—Nordheim Opens New York Branch—Col. Colt Receives Silk Flag

Banquet of Racine Rubber Tire Co.

The Racine Rubber Tire Co. of New York, Inc., tendered its third annual banquet to its agents at the Hotel McAlpin, New York, on Thursday evening, Jan. 10. The keynote of the evening was "optimism." The speakers included Edgar Storms, Jr., president of the Racine Rubber Company of New York; H. L. McClaren, president of the Racine Rubber Company of Racine, and Joseph H. Finn, president of the Nicholls-Finn Advertising Co.

Two hundred and fifty representative dealers in automobiles and accessories from all parts of New York State and New Jersey attended the banquet. Mr. McClaren, in the course of his remarks stated that with the exception of the congestion in the transmission of merchandise by freight and express, he could see no logical reason why the year 1918 should not be most productive in the way of excellent business.

Mr. Storms was emphatic in his statement that every man owed a duty to himself and to his country as well as to his business to be an optimist to the extent, at least, that he have confidence in himself, his business and his country. He further stated that the curtailment of production on the part of automobile manufacturers could not but result in a splendid stimulus to the industry at large. The result must inevitably be a demand for automobiles in excess of supply; an outlet for accumulated second-hand automobiles at a better price; repair departments in connection with all service stations working to capacity in the maintenance of automobiles, which, under normal conditions would be exchanged for new ones; a great stimulus in the sale of accessories on the theory that the old car needs from the retail merchants more than the new one and the result must be beneficial for the entire industry.

BANQUET OF THE RACINE RUBBER TIRE CO. OF NEW YORK

Presentation to William T. Rodenbach

Employes of the Goodyear Metallic Shoe Co., Naugatuck, Conn., on Jan. 10 presented William T. Rodenbach, treasurer of the company, who has been appointed as inspector general of rubber supplies for the United States Government and its allies, with headquarters in Washington, D. C., for the duration of the war, with a silk American flag, a walking stick and a scarf pin. The presentation was made by C. F. Lander, who emphasized the fact that Mr. Rodenbach is making a great sacrifice for his country in leaving a place which he has served so many years.

In 1886, Mr. Rodenbach became connected with the Goodyear Metallic Shoe Co., and in 1895 was elected treasurer. Meanwhile for sixteen years he managed the reclaiming plant of the United States Rubber Co., at Naugatuck, and has been connected in an official capacity with the Naugatuck Chemical Co. since 1907. He was recently elected treasurer of the Goodyear India Rubber Glove Manufacturing Co., in connection with the Goodyear's Metallic Shoe Co. Mr. Rodenbach's experience and knowledge of the rubber world will make him of the greatest value to the Government.

Sebring to Build

The directors of the Sebring Tire & Rubber Co., Alliance, Ohio, recently authorized the construction of two more buildings and an addition to the present main building in order to increase the capacity of the plant from 150 to 500 tires a day. The company hopes to complete the buildings by Feb. 1.

Lynn Rubber Building in Bristol

The Lynn Rubber Manufacturing Co., Lynn, Mass., plans to build a two-story factory in Bristol, R. I.

Pearce Stockholders Hold Annual Meet

The annual business session of the stockholders of the Pearce Tire & Rubber Co., Akron, Ohio, was held on Jan. 7, at the company's new plant at the foot of Benefit street. There were more than 100 shareholders in attendance, and the following board of directors was elected for the ensuing year: A. E. Pearce, Ashtabula; Charles L. Foster, Alliance; W. E. Wilkins, Warren; H. H. Swan, Akron, and Emil J. Anderson, Youngstown.

The directors elected the following officers: A. E. Pearce, president and general manager; W. E. Wilkins, secretary and treasurer, and H. H. Swan, general superintendent. At the meeting the stockholders offered a special vote of thanks for the efficient manner in which the business affairs of the company had been handled during the past year.

The remainder of the balance of the capitalization was taken by the present stockholders, who now number close to 700. The total capitalization of the company is $200,000, all common stock. No more common stock is to be issued and the surplus earnings will be used in extending the plant and developing the business.

Colonel Colt Receives a Silk Flag

The employes of the Goodyear's India Rubber Glove Manufacturing Co., and the Goodyear's Metallic Rubber Shoe Co., both of Naugatuck, Conn., and both subsidiaries of the United States Rubber Co., System, New York, recently presented Col. Samuel P. Colt, President of the United States Rubber Co., System, with a silk flag and a set of resolutions, as tokens for the many benefits received from the parent company.

Subscriptions were limited to ten cents, and sufficient money was raised to purchase the silk flag and turn over a balance of $50 to the Naugatuck chapter of the Red Cross.

Moore Sent to San Francisco

(Special Akron Correspondence.)

Robert Moore, formerly of the Akron Mohawk Rubber Co., has been sent to San Francisco as office manager of the new Mohawk branch.

News of the Rubber Metropolis

Goodrich Completes Factory Subway—Goodyear Installs Class in Telegraphy —Kershner Is Awarded Medal—Lindeman Returns Home— New Akron Song

Goodrich Completes Factory Subway

(Special Akron Correspondence.)

The B. F. Goodrich Co. has recently completed a subway system which connects all the factory buildings, and enables the transportation underground, of materials from one building to another throughout the more than one hundred acres occupied by the world's largest rubber factory.

The enterprise is probably the biggest of its kind in any manufacturing concern in the world. Some 13,000 cu. yds. of earth were removed in burrowing between buildings.

With the equipment of big freight elevators, the subway makes it possible to transport materials from any part of one building to any section of another building without exposing the materials to outside temperatures.

This system enables the factory to save valuable time in the handling of materials and insures greater efficiency in inter-factory transportation, and greater economy of manufacture.

New Akron Patents

(Special Akron Correspondence.)

The following Akron men have recently been granted new rubber patents:

C. R. Evans, Akron, assignor to the B. F. Goodrich Co., wire assembling machine; J. C. Lauritzen, Akron, assignor to the B. F. Goodrich Co., oven for drying cord, also method for making hollow cord; C. W. Bedford, Tallmadge, assignor to the Goodyear Rubber Co., halogenation of gaseous hydrocarbons and their halogen derivatives; Robert Butler and E. A. Tinsman, Barberton, cutting attachment for calendering machines; F. J. Creque, Cuyahoga Falls, toy balloon; W. C. Greer, Akron, assignor to the B. F. Goodrich Co., compounding of rubber; Charles Blanc, Akron, assignor to The Goodyear Co., preparation of chole—substitution products of the saturated paraffin hydrocarbons; J. R. Gammeter, Akron, assignor to the B. F. Goodrich Co., tire calipers, also balloon fabric; M. Braley, Akron, assignor to the Akron Biltwell Tire and Rubber Co., design for vehicle wheel tire.

Rubber Manufacturers Affected

(Special Akron Correspondence.)

Akron rubber companies were hard hit by the recent Garfield holiday. Only the gas mask and a few other war-goods departments operated at the Goodrich and Goodyear.

Although thousands of idle men roamed the streets of the Rubber City, no disturbances of any kind were reported. In fact, because all saloons were closed during the workless period, the police-court records showed less petty crime than usual.

One of the most significant results of the workless period was a mass-meeting called at the Central Labor Union here for rubber workers. It was called on Tuesday. Thousands attended and were urged to form a rubber-workers' union. Akron rubber companies run "open shops."

Thomson Offers Suggestion

(Special Akron Correspondence.)

G. Thomson has been awarded $200 for a suggestion submitted to the suggestive system of the Goodyear Rubber Co. The suggestion had to do with geared stitches on cord tire machines.

Kershner Awarded Medal

(Special Akron Correspondence.)

William G. Kershner, twenty-eight, employed by the Goodyear Tire & Rubber Co., was awarded a hero medal and $1000 when the Carnegie Commission met in Pittsburg recently, and made the year's awards.

Kershner was twenty-seven and was employed as a saw-mill hand in Palestine, W. Va., when he performed the act for which he was awarded the medal.

Kershner attempted to rescue William L. Barnett, aged twenty-five, chauffeur, who had broken through the ice on Muddy Creek 75 feet from the bank, where the water was eight feet deep. Kershner went toward him with a board, but broke through the ice eighteen feet from him. He then discarded the board, swam to Barnett, took him to the edge of the ice and supported him at the surface. Men approached and threw the end of a 30-ft. rope to Kershner, who tried to attach it to Barnett, but failed because he was numb. The men then got the end of the board under Kershner, and he wrapped the rope around his back. He was pulled out but he lost his hold on Barnett, who sank and was drowned.

Lindeman Home

C. B. Lindeman, of the staff of Edward S. Babcox, advertising manager of Firestone Tire & Rubber Co., Akron, Ohio, has just returned to this country from a term of service in France, as ambulance driver and later as truck driver. When these men were discharged from the service with the French army and taken over by General Pershing, there was no ambulance work for them. Lindeman wished to enter the regular service, but could not pass the examining surgeons, so he was taken on by the Paris Firestone office, and comes home on business.

F. H. Holton Dies

(Special Akron Correspondence.)

Francis H. Holton, pioneer Akron rubber man and inventor, died here a few days ago at the age of 86.

Mr. Holton had charge of the drug and stationery supply department of the B. F. Goodrich Co.

He was the inventor of the soft-rubber eraser and of the rubber-cap protector for soldiers. He came to Akron 30 years ago.

Mr. Holton is survived by his wife and two grandchildren.

Union Meeting Called

(Special Akron Correspondence.)

At a specially called meeting of the Akron Central Labor Union on "workless" Sunday, preceding the first Garfield Monday, the fuel administration was indorsed in its stand. The only dissenting vote was cast by the machinists' union, which demanded the removal of the fuel administrator.

Soldiers Guard Goodrich

(Special Akron Correspondence.)

Several hundred picked soldiers are acting as inspectors of war goods being made at the B. F. Goodrich Co., for Uncle Sam.

They are from regiments in all parts of the United States, and most of them are technical experts.

Goodyear Installs Class in Telegraphy

As a measure of cooperation with the Government in assisting in the training of men as telegraphers, the Goodyear Tire & Rubber Company, Akron, Ohio, has inaugurated a class in telegraphy. The class is being operated in connection with the company's factory school, and is in charge of the company's wireless operator. The course that has been formulated covers a period of twenty weeks. The Goodyear plant operates twenty-four hours a day, in shifts of eight hours each, but the classes have been arranged so that every employe desiring the course, may be accommodated, no matter what factory shift he may be working on.

This cooperative measure is but one of many that the company has put into effect to supplement the training of men for our army of democracy. These measures have covered a wide range of subjects, all of which have helped the men to obtain earlier promotion from the ranks than would have been possible without them. Two thousand men have gone out from this company's organization, many of whom have written that their chances for promotion had been greatly enhanced because of the training secured in the factory school classes.

Root Transferred

(Special Akron Correspondence.)

Frank M. Root, head of the statistical department at the B. F. Goodrich Co., was transferred to Chicago, Feb. 1. He has been made operating manager of the Chicago branch, and will make his home in the Windy City.

Root, who has lived in Akron most of his life entered the rubber business with the old Diamond Rubber Co. Before that he was employed for ten years at the Diamond Match Co. at Barberton. When the Diamond and Goodrich rubber companies consolidated, Root was made head of the department of statistics.

Goodyear Supplies Coal to Employes

Employes of the Goodyear Tire & Rubber Co., Akron, Ohio, who are unable to secure a sufficient supply of coal to meet their household needs from regular sources, are being supplied with coal by the company. More than 2,500 tons have already been supplied in two-ton lots to Goodyear workmen. But for this arrangement many families would have experienced great inconvenience during the recent extremely cold weather.

Miller Service Free

(Special Akron Correspondence.)

C. S. Norris, manager of the tire service station of the Miller Rubber Co., has announced that in the future all repairs on Miller tires will be done free of charge. No matter where the motorist meets with an accident to his tires, the Miller quick service car will reach him, repair the tire and enable him to continue his journey without long delay.

Song for Akron

(Special Akron Correspondence.)

As singers the Akron auto and rubber men, who attended the Cleveland auto show recently made a decided hit. The song that drew the biggest encore was on Akron, sung to the tune of "Tipperary." The words were as follows:

"We are all here to boost for Akron,
It's the best town we know;
If you are looking for brains and ginger,
It's the only place to go;
We have industries large and growing,
We have progress everywhere;
It's a real, live town, this dear old Akron,
And our homes are there."

Market for Manufactured Rubber Goods

NEW YORK, Jan. 29, 1918.

The rubber business, like most all others, has been adversely affected by the abnormal weather conditions and by the general uneasiness in industry due to the shortage of coal and the continued breakdown in transportation. The East has suffered much more and over a longer period than any other section of the country, and conditions can hardly be appreciated by those who are not in close touch with the situation. In the Eastern States the steps toward a partial closing of business houses was under way before the official notice of the national fuel administrator was issued, and his decree has been supplemented in many cases by other orders which are somewhat more stringent than those given out from Washington. The orders are being obeyed with remarkably good grace.

The wholesale trade in New York City speaks of transportation difficulties as having eased up a bit during the last few days, the freight embargoes in certain directions having been raised temporarily. The New York, New Haven & Hartford Railroad Co., for instance, which started to refuse freight several weeks ago, again accepted shipments on Jan. 18.

In spite of all these difficulties no great falling off of sales in the jobbing trade is reported. A canvass of the trade in New York showed that the sales so far this month are but little below those of last January, which was an abnormal month. There is a growing appreciation of the fact that there is to be an increasing difficulty in obtaining goods, and retailers are placing orders for more than present stock needs on many articles. The jobbers' shelves show vacant spots in many places and the general belief is that these holes will grow larger and more numerous in the next two months.

MECHANICAL GOODS

Inventories that have just been taken, show that in average cases business last year was very satisfactory. The outlook for the present year is good, but mill supply houses in many instances are said to be slow in buying very far ahead except on a few staple articles.

There have been few changes in the prices of staple goods, but special items continue to advance in value, and there are good reasons to believe that this movement will continue because of the scarcity of raw materials and the increase in other items of production costs.

PNEUMATIC TIRES

If the reports of many dealers can be taken as indications of the general situation the automobile tire business is at a standstill on the retail end. Only emergency purchases are said to have been made last week, as the very severe weather prevailing in the East and Middle West has curtailed the use of motor cars as well as disrupting transportation means of all kinds. A general review of the situation would show that business was at a very low ebb last week and probably was lower than for any similar period, not even excepting holiday weeks.

On the wholesale end of the business it is reported that dealers have been showing a better disposition towards the placing of orders for Spring dating. This tendency to "stock up" would indicate confidence in the future.

To recapitulate, the severe cold weather and the heavy snows have caused many owners of automobiles, who otherwise would have used their cars the year around, to put their machines up for the Winter. This has cut down to some extent the new demand for pnuematic tires. On the other hand, and evidently with good reason, the trade has every confidence in the seasons to come. The curtailment in production of cars is a fact, but it does not mean that the thousands of dealers are going to go out of business. Automobiles, which under normal conditions would have been consigned to the junk heap, will this year be overhauled and kept in condition. People who have been in the habit of buying new cars each year, if unable to get new ones this year, will have their old ones put in shape. The automobile has grown to be a necessity, not as some people would put it, for pleasure use, but for actual utility.

SOLID RUBBER MOTOR TIRES

The greatest problem in this country is one of transportation both in the cities and in the country and motor vehicles have grown to be one of the biggest factors in transportation. The demand for solid rubber tires is enormous, and most factories are behind on their orders for these goods, especially those whose products are widely advertised and of recognized quality.

DRUGGISTS' SUNDRIES

Reports show that in many parts of the country wholesale business in druggists' sundries has made a remarkable showing to date this year. Road salesmen who were at their homes during the holidays have now been back on their routes long enough to get a line on trade conditions, and already they are sending in a good volume of orders. There is apparently a normal amount of orders both for immediate and for future deliveries, and many manufacturers are worried concerning their ability to fill the demand for goods. Both jobbers and dealers are for the most part very optimistic and express the belief that the halt in business and industry brought about by the fuel administrator's coal order will be only momentary and that business will recover very quickly. The heavy snows and continued cold weather have greatly stimulated sales of seasonable goods, particularly water bottles.

FOOTWEAR

All visible supplies of rubber footwear appear to have been taken up by the public. The warehouses of both manufacturers and jobbers as well as the shelves of retail dealers have been completely denuded of stock. All hands are doing business on a hand-to-mouth basis, distributing their goods as equitably as possible among their customers. The breakdown of transportation, added to the heavy demands of the Government have created unprecedented conditions in the trade. Shipments from New England factories are arriving in New York five and six weeks after shipment and jobbers open the cases and distribute their contents without delay. Morning arrivals usually leave the jobbers' premises in the forenoon, no goods remaining over night in the wholesale houses. Labor is scarce and money is tight and practically unobtainable for factory improvements and private enterprise, due to the Government's drain on the market.

The Fabric Market

NEW YORK, Jan. 29, 1918.

In face of the series of sharp blows it has received during the last two weeks, the raw cotton market holds up remarkably well.

Of the adverse developments the most important has probably been the fuel conservation order, which means a considerable curtailment of American consumption of cotton. If all the mills were run by steam, and all were under the coal order, it would be easy to figure this curtailment at around 250,000 bales, but this would be an exaggeration with so many mills independent of coal and so many running on Government requirements, which was exempted from the operation of the Fuel Administrator's order.

On the whole the raw cotton market can be expected to go slow for the present. However, purchases can still be considered advisable, for, unless peace comes, a bear market is likely to develop.

EGYPTIAN COTTON

As stated in our last report, Egyptian cotton has ceased to be a factor in the calculations of American rubber manufacturers, arrivals being small and far between.

SEA ISLAND

The Savannah market continues to be very quiet. Though there has been an undercurrent of inquiry, no transactions have been reported recently. Some business would probably be done if owners were willing to sell even rubbing grades, but they show no disposition to do this, and as receipts include a considerable proportion of cotton lower than choice it would be necessary to obtain very high prices for the best grades in order to be protected against loss on the overs. More than half of the unsold stock in Savannah is supposed to consist of cotton recently thought to be purchased by the Government.

The ginners' report shows 88,747 bales ginned up to January 16th, against 115,592 last year. The ginning by States this year is as follows: Florida, 36,862; Georgia, 45,651; South Carolina, 6234.

NEW RULING ON RAW COTTON

The War Trade Board has amended the ruling in regard to the exportation of raw cotton as follows:

"On January 8 and thereafter, until further action is taken by the Board, no individual licenses shall be required for the exportation of raw cotton to the United Kingdom, France, Italy or Japan, or their colonies, possessions or protectorates, with the exception of Egyptian and Sea Island cotton, the exportation of which to any country of the world will on and after that date, January 8, require an individual license. It is necessary, therefore, that shippers' declarations covering shipments of raw cotton destined to either Great Britain, France, Italy or Japan, state clearly thereon the exact type of raw cotton to be shipped."

YARNS

Cotton yarn spinners are very firm and hard to deal with, owing to the uncertainty of delivery and the firm condition of the raw cotton market. Many spinners were hard hit by the Garfield edict, one of the effects of which was to cause the withdrawal from the market of some of the mills that had hitherto been willing to sell for future delivery in a moderate way. Production has fallen off considerably and some spinners are unable to make deliveries even when they can ship.

FABRICS

Cotton fabrics are very strong, with contracts in many places covering a large volume of business. The production of the mills has been cut down greatly by the shortage of coal and merchandise is tied up in the Eastern section of the country by embargoes on railroad and steamship lines. The dearth of some goods has made spot markets unusually strong in practically all lines.

TIRE FABRICS

There is little new to report in the tire fabric market, which continues to be generally quiet. Prices remain firm and buyers as well as mill men show a cautionary spirit.

The production of the mills will no doubt suffer from the effects of the Fuel Administrator's order and mill men predict a shortage of fabric before the year is over.

HOSE AND BELTING FABRICS

As has been stated in previous reports, the mills have not been able to keep pace with the demand for mechanical ducks. The shortage of fuel and the Garfield order have further curtailed production for the regular trade, and it is very likely that a serious shortage of hose and belting fabrics will make itself felt this summer. Many fabric orders are coming in that the mills decline to book. The market is very firm and prices are tending towards higher levels.

DRILLS, OSNABURGS AND SHEETINGS

Mill representatives are expecting that production will be very slow, but many of them believe there are goods held by speculators and that, should the money markets take a turn where bank accommodation will not be freely accorded in carrying speculative accounts, many of the speculators will be forced to sell.

GARMENT CLOTHS

There is a good demand for fabrics for proofing for special needs and buyers are having great difficulties in getting even limited lots of materials. Several mills have withdrawn from the market for the next two months' deliveries, as they are at a loss to see how they can catch up with deliveries already overdue.

BURLAPS

Cables from Calcutta report a strong burlap market. Prices quoted, however, are lower than the highest prices named recently. It is believed that there is an actual shortage of burlaps in India. In New York the market is inactive. Prices are nominal. The Government is in the market for a large number of bags made of 36-inch burlap counting 13 x 15. Importers say that this description is very scarce, and they believe that other goods more freely available would give equal satisfaction.

NEW YORK QUOTATIONS

TIRE FABRICS.

17¼-ounce Sea Island, combed, sq. yd.		$1.62@1.73
17¼-ounce Egyptian, combed		1.24@1.60
17¼-ounce Egyptian, carded		1.30@1.35
17¼-ounce Peelers, carded		0.75@1.13
17¼-ounce Peelers, combed		1.00@1.05

MECHANICAL DUCKS

Hose (nominal)		.65@ .70
Belting (nominal)		.65@ .70

DUCKS

Single Filling (pound basis)	lb.	.64
Double Filling (pound basis)		.75

DRILLS

37-inch 2.35-yard	yd.	.28
37-inch 2.75-yard		.24
37-inch 3.00-yard		.23
37-inch 3.25-yard		.20
37-inch 3.50-yard		.19
37-inch 3.95-yard		.15
38-inch 2-yard Southern	lb.	.52
38-inch 2.00-yard Northern		.55
40-inch 2.47-yard Northern	yd.	.26
40-inch 2.47-yard Northern		.33
52-inch 1.90-yard Southern		.35
52-inch 1.90-yard Northern		.32
52-inch 1.95-yard Southern		.36
52-inch 1.95-yard Northern		.35
60-inch 1.52-yard Southern		.40
60-inch 1.52-yard Northern		.40

SHEETINGS

40-inch 2.25-yard	yd.	.28
40-inch 2.50-yard		.25
40-inch 2.85-yard		.23
40-inch 3.00-yard		.21
40-inch 3.25-yard		.24
40-inch 3.60-yard		.21
40-inch 3.75-yard		.20
40-inch 4.25-yard		.15
38-inch Jacket Cloths	yd.	20.-22

TWILLS FOR PROOFING

37-inch 2.85-yard	yd.	.23
37-inch 3.25-yard		.28
37-inch 2.10-yard		.33

COTTON STOCKINETTES

(52-inch)

E—11½-ounce	yd.	.85
A—11 -ounce		.70

BURLAPS

(Spot Carload Lots)

40-inch 8 -ounce		17.25
40-inch 10 -ounce		21.25
40-inch 10½-ounce		21.50

Chemicals and Compounding Materials

NEW YORK, Jan. 29, 1918.

Delay in receiving shipments of chemicals, colors, etc., due to transportation difficulties, resulted in stiffening spot prices for many of the commodities in the list. The enforced holiday period has had little influence upon the market, for it is pointed out that restricted consumption is fully offset by the curtailment in production. Business, taken as a whole, has been fairly active, and advances noted during the last fortnight were more numerous than declines. Aniline oil is moving more freely and sales of round-lots at full prices have been reported. Antimony products ruled steady. No further weakness has been noted in caustic soda. Dry colors, the lead and zinc pigments, sulphur, aluminum flake and acids ruled firm. Benzol was one of the few weak spots, sales passing at concessions from the previous basis.

ALUMINUM FLAKE

The price has been advanced to $29 per ton, in barrels, by several handlers. There is a good inquiry and with shipments held up, etc., the tone of the market is strong.

ANTIMONY SULPHURETS

Prices are holding steady on all of the well-known brands. Producers and importers say that stocks are moderate. Red sulphuret is quoted at 25 to 26c. per pound. Golden is held at 26 to 28c. per pound, as to seller, with the crimson at 47 to 52c. per pound.

BENZOL

Producers report a good outlet for pure benzol, but with production heavy the tendency of prices is downward. Several large contracts have been closed on the basis of 35c. per gallon, in tanks, f o b works, immediate and forward shipment. For benzol in drums prices range from 40 to 42c. per gallon.

CAUSTIC SODA

The spot market has been steady at 6 to 6¼c. per pound for the 76 per cent tests, fused. Delay in shipments has brought liquidation to a halt. Toward the close some sellers would not shade 6¼c. Futures also held at 6 to 6¼c. per pound.

COLORS

A sharp upturn in the market for quicksilver brought out a firmer feeling in the trade for vermilion. English vermilion is in scanty supply and towards the close $2 to $2.10 per pound represented nominal prices. Blacks are in scanty supply, as a result of the shipping complications, and prices are strongly maintained.

LEAD PIGMENTS

There was an advance in the price of pig lead, but so far this has not influenced the market for the pigments. Sublimed is held at 8½ to 8¾c. per pound by corroders, the inside figure obtaining for round-lots. Lithopone closed unchanged at 6½ to 7c. per pound, as to quantity.

SULPHUR

Large quantities of crude are being held at the mines awaiting better shipping conditions. Until the crude material can be moved more freely, refiners look for prices to hold firm. Commercial sulphur is held at $3.35 per 100 pounds, carlot basis, with the flour, refined, at $3.85 per 100 pounds, car-lots, in barrels.

ZINC OXIDE

Contract prices for XX zinc oxide are holding at 10¼c. per pound. The market is steady. The XX red is held at 13 to 14c. per pound on the spot, in moderate quantities.

Prices Current for Chemicals, Fillers, Colors, etc.

Acetone	lb.	.39	@	.40
Accellerator, in drums	lb.	.80	@	.90
Acids, Acetic, 28%	lb.	.05½	@	.06
Carbolic, C. P.	lb.	.53	@	.54
Cresylic, 95%	gal.	1.10	@	1.15
Muriatic, 20 deg.	lb.	.02	@	.02¼
Muriatic, 22 deg.	lb.	.02½	@	.02⅝
Nitric, 40 deg.	lb.	.08½	@	.08¾
Nitric 42 deg.	lb.	.09¼	@	.09½
Sulphuric, 60 deg.	lb.	.01¾	@	.02
Tartaric, crystals.	lb.	.78½	@	—
Aluminum Flake	ton	28.00	@	30.00
Aniline oil, bulk basis	lb.	.27	@	—
Antimony, metal spot	lb.	14.00	@	14.37½
Oxide	lb.	15.00	@	16.00
Sulphuret, red	lb.	.25	@	.26
Sulphuret, golden	lb.	.26	@	.28
Sulphuret, crimson	lb.	.47	@	.50
Asbestos	ton	35.00	@	45.00
Asphaltum, Egyptian	lb.	.22	@	.28
Domestic	ton	20.00	@	26.00
Barium sulphate, technical	lb.	.04¼	@	.04¾
Chloride	lb.	.04	@	.05
Barytes, prime white imported	ton	*38.00	@	42.00
white, domestic	ton	30.00	@	33.00
off color, domestic	ton	19.00	@	21.00
Benzol, pure, bulk	gal.	.35	@	.40
Beta-naphthal, sublimed	lb.	.85	@	.90
unsublimed	lb	.65	@	.70
Blacks, Drop	lb.	.08	@	.15
Ivory	lb.	.16	@	.30
Carbon gas, cases	lb.	.24	@	.28
Lampblack R. M.	lb.	.05	@	.07
Mineral blacks	ton	27.00	@	32.00
Blues, Prussian	lb.	.65	@	1.35
Soluble (potash)	lb.	1.35	@	1.60
Ultramarine	lb.	.20	@	.38
Browns, Umber, Turkey, burnt, powdered	lb.	.04	@	.05
American, burnt	lb.	.03½	@	.03¾
Cadmium sulphide, yellow	lb.	2.00	@	2.25
Carbon, bisulphide, bulk	lb.	.07¼	@	.07¾
tetrachloride, drums	lb.	.15½	@	.16
Caustic Soda, 76@78%	lb.	.06¼	@	.06½
Chalk, precipitated, extra light	lb.	.05	@	.05¾
light	lb.	.04¾	@	.05¼
heavy	lb.	.03¾	@	.04¼
China clay, domestic	ton	18.00	@	22.00
imported	ton	35.00	@	40.00
Fossil flour	lb.	.03¾	@	.05
Gilsonite	ton	40.00	@	44.00
Glue, extra white	lb.	*.35	@	.45
medium	lb.	*.30	@	.35
low grade		*.25	@	.30
Glycerine, C. P. (drums)	lb.	.67½	@	—
Graphite, flake (bbl.)	lb.	.18	@	.20
powdered (bbl.)	lb.	.13	@	.15
Green, chrome, R. M.	lb.	.12	@	.20
Ground glass (fine)	lb.	.03	@	—
Hexamethylene	lb.	1.00	@	1.05
Infusorial earth, powd'd	ton	60.00	@	—
bolted	ton	70.00	@	—

Iron oxide, red, reduced grades	lb.	.05 @	.06
red, pure, bright	lb.	.11 @	.13
Lead, red oxide of	lb.	.10 @	.10½
sublimed blue	lb.	.08½ @	.09
white, basic carb.	lb.	.09 @	.09½
white basic sulph.	lb.	.08½ @	.09
Lime flour	lb.	.01½ @	.01¾
Litharge	lb.	.09½ @	.10
English	lb.	*.12 @	.13
sublimed	lb.	.09¼ @	.09¾
Lithopone, domestic	lb.	.06½ @	.07
Magnesia, carbonate	lb.	.11½ @	.13
calcined, heavy	lb.	.11½ @	—
calcined, light	lb.	.70 @	—
Magnesite, calcined, pwd.	ton	65.00 @	70.00
Mica, powdered	lb.	.03¾ @	.05
Mineral rubber (asphaltum base)	ton	50.00 @	65.00
Naphtha, motor gasoline, (steel bbls.)	gal.	.24 @	—
68 @ 70 degrees (steel bbls.)	gal.	.30 @	—
70 @ 72 degrees (steel bbls.)	gal.	.31 @	—
73 @ 76 degrees (steel bbls.)	gal.	.33 @	—
machine (wood bbls.)	gal	.41 @	—
Oil corn, crude	cwt.	18.50 @	18.75
corn, refined	cwt.	22.35 @	22.65
linseed (bbl.)	gal.	1.28 @	1.30
palm, Lagos	lb.	*.31 @	.31½
pine, yellow	gal.	.45 @	.46
rapeseed, refined	gal.	1.65 @	1.70
rapeseed, blown	gal.	1.70 @	1.75
rosin, first rectified	gal.	.42 @	.43
tar (commercial)	gal.	.30 @	.32
Orange mineral, American	lb.	.13 @	.13½
imported	lb.	*.15 @	.20
Petrolatum, bbls., amber	lb.	.05 @	.05¼
pale yellow	lb.	.05¼ @	.05½
Pipe, tar, kiln	bbl.	13.50 @	14.00
Pitch	bbl.	4.25 @	4.75
Plaster of paris	bbl.	2.00 @	2.50
Red, Tuscan	lb.	.24 @	.30
Indian (reduced)	lb.	.06 @	.07
Standard	lb.	.08 @	.11
Rosin (common to good), @ 280 lbs.	bbl.	6.95 @	7.10
Rotten stone, powdered	lb.	.03 @	.04½
Rubber, substitute, black	lb.	.12 @	.16
white	lb.	.15 @	.20
brown	lb.	.18 @	.22
Shellac, fine orange	lb.	.66 @	—
T. N.	lb.	.58 @	.59
Bleached, ordinary	lb.	.56 @	—
Bleached, bone dry	lb.	.66 @	.67
Silex (silica)	ton	24.00 @	34.00
Soapstone, powdered	ton	12.00 @	20.00
Starch, corn, powdered	lb.	.05¾ @	.06½
Sulphur, crude	ton	*50.00 @	..
refined, flour, per 100-pounds, in bbls.		3.85 @	4.40
roll		3.70 @	4.15
commercial		3.35 @	3.65
Talc, American	ton	15.00 @	18.00
French	ton	22.00 @	30.00
Toluol, pure, in drums	gal.	*3.50 @	5.00
Tripolite earth	ton	60.00 @	65.00
Turpentine, pure gum—spirits	gal.	.48½ @	.49
wood	gal.	.43½ @	.44
Venice, artificial	gal.	.12 @	.13
Vermilion, English	lb.	*2.00 @	2.10
Wax, beeswax, crude yel.	lb.	.35 @	.37
ceresin, white	lb.	.18 @	.19
carnauba, No. 3	lb.	.50 @	.52
Montan	lb.	*.35 @	.40
ozokerite, black	lb.	.75 @	.80
ozokerite, green	lb.	*.85 @	.95
Paraffin, refined, 118/120 M. P. (bbls.)	lb.	.11¼ @	.11½
Wax, paraffin, 123/125 M.P.	lb.	.12½ @	.12¾
128/130 M.P.	lb.	.13 @	.13¼
133/136 M.P.	lb.	*.14 @	.14½
Crude, 120/122 M.P.	lb.	.08¾ @	.09
124/126 M.P.	lb.	.09¼ @	.09¾
Whiting, commercial	cwt.	.95 @	1.10
Alba	cwt.	1.00 @	—
Paris, white, American	cwt.	1.25 @	—
English cliffstone	cwt.	1.50 @	—
Yellow chrome	lb.	.23 @	.25
Zinc oxide, American process, horsehead brand	lb.	†.10¼ @	.10½
selected	lb.	†.10¾ @	.11
"XX red"	lb.	†.10¼ @	.10½
French process, green seal	lb.	†.13½ @	.13¾
red seal	lb.	†.13 @	.13¼
white seal	lb.	†.14 @	.14¼
Zinc substitutes	ton	30.00 @	35.00
Zinc, sulphide, pure	lb.	*.07½ @	.08

†Contract prices. *Nominal.

The Crude Rubber Market

NEW YORK, Jan. 29, 1918.

The market for crude rubber was inactive, and on freer offerings prices went off rather sharply. Contrasted with the prices named a fortnight ago net declines of 3½ to 5c. per pound were registered, with the Brazilian grades leading in the downward movement. Stocks of crude rubber in the hands of manufacturers are liberal, despite the transportation difficulties, and with consumption curtailed by the closing order of the Fuel Administration buying operations have been restricted. Many of the larger manufecturers are holding aloof to see what effect the enforced holiday periods will have on business. Futures were offered at prices which would have been considered comparatively low less than a year ago, yet under present conditions buying interest was lacking.

A circular has been issued by the Rubber Growers' Association of London suggesting that leading rubber producers consent to reduce their output by 20 per cent. It is believed that this proposition will meet with general approval should prices continue to fall. Operators here showed little interest in the report, claiming that a 20 per cent reduction in the output would still insure adequate supplies for 1918. Last year the United States imported approximately 160,000 tons of crude rubber.

Spot stocks of certain descriptions of crude rubber occasionally drop below normal, as a result of the transportation situation. At present this is the case with ribbed smoked sheets, which grade is commanding a premium over first latex, covering the spot position only. First latex pale crepe is offering on spot at 54 to 54½c. per pound, while ribbed smoked sheets is held around 56 to 57½c. per pound. First latex pale crepe for March-June delivery is held at 54c. per pound, with July-December at 52c. per pound. Ribbed smoked sheets for July-December closed nominally at 51½c. per pound, while brown crepe for the second half of 1918 shipment settled at 45c. per pound.

The arrival of several round-lots of Brazilian rubber resulted in selling pressure. The plan of the Brazilian government to sustain values has come to naught. Para up-river fine closed at 56c. per pound, which compares with 61c. a fortnight ago. Up-river medium was available down to 50c. per pound, with coarse at 36½c. Caucho ball settled at 36 to 36½c., with Cameta at 25c. per pound. Islands fine sold at 46c. per pound.

Weakness in Brazilian and Ceylon grades brought out lower prices for Centrals. Prime Corinto and Esmeralda were available around 36c. per pound, with the demand quiet. Guayule also was easy, being quoted at 26 to 27c. per pound. Pontianak held at 12 to 12¼c., with prices fairly steady on account of the high freights, which is an important factor with cheap commodities.

London prices went off on lack of support. First latex pale crepe closed at 27¼d. per pound, prompt shipment, with ribbed smoked sheets at 27d. per pound, prompt.

	Spot.	Mar.-June.	July-Sept.
Para—Up-river fine lb.	56	56	..
Up-river medium	50	50	..
Up-river coarse	36½	37	..
Caucho ball	36	35½	..
Islands fine	46	..	..
Islands coarse	25	26	..
Cameta	25	25	..
Medeira fine	60	..	..
Ceylons-Smoked sheets, ribbed	*56	53½	51½
Smokers sheets, plain	53½	52	50
First latex pale crepe	54½	54	52
Amber crepe	50	48	47
Clean brown crepe	47	46	45
Centrals—Corinto, prime	36	36	..
Esmeralda, prime	35½	35½	..
Mexican scrap	35	35	..
Balata, sheets	*82	..	..
Balata, block Panama	54	53	..
Guayule	26	..	..
Africans—Rio Numez, string	*62	..	..
Massai, red	*48	..	..
East Indian Pontianak	12	12	..
Palembang	12¼	12¼	..

* Nominal.

Scrap Rubber

Little buying is being done by rubber reclaimers, but scrap rubber dealers on their side do not appear to be over anxious to sell and the tone of the market is fairly steady.

The following prices were paid for scrap rubber delivered at the reclaiming mill:

Boots and shoes	9 @	9½
Arctics, trimmed	.. @	7
Arctics, untrimmed	.. @	6
Tires—Automobile	.. @	5½
Bicycles, pneumatic	5 @	..
Mixed hose	.. @	2¼
Air brake	.. @	5
Inner tubes, No. 1	21 @	..
Inner tubes, No. 2	.. @	10½
Red	.. @	10½

Crude Rubber Imports

Revised Importations of Crude Rubber Into the United States During December, 1917

The January 10 issue of THE RUBBER AGE AND TIRE NEWS printed a table, compiled by The Rubber Association of America, showing approximately the importations of crude rubber into the United States during December, 1917. Since the publication of this table, additional figures have become available, which made it necessary to compile the following revised statistics of crude rubber imports:

REVISED IMPORTATIONS OF CRUDE RUBBER INTO THE UNITED STATES DURING DECEMBER, 1917

Figures compiled by The Rubber Association of America, Inc., 17 Battery Place, New York City. (Estimated net weights.)

PLANTATIONS

From	*Tons*
Liverpool	117
Hull	7
London	105
Singapore	6,216
Colombo	109
Batavia	1,442
British India	71
*Japan	2,522
	10,589

MANICOBAS AND MATTO GROSSO

Manaos	7

AFRICANS

From	*Tons*
Liverpool	13
Hull	44
Bordeaux	20
Lisbon	32
	109

CENTRALS AND GUAYULE

Centrals (Mexico and Central America)	118
Guayule (Mexico)	196
	314

PARAS

Manaos	163
Para	1,588

* And other countries.

GUMS, WASTE RUBBER, ETC., IMPORTED FROM VARIOUS SOURCES

From	*Tons*	*From*	*Tons*
Waste	287	Balata	32
Reclaimed rubber	24	Miscellaneous	212

COMPARISON 1916-1917

	Dec., 1916 *Tons*	Dec., 1917 *Tons*
Plantations	9,042	10,589
Paras	2,123	1,751
Africans	508	109
Centrals	194	118
Guayule	11	196
Manicobas and Matto Grosso	155	7
	12,033	12,770

MONTHLY IMPORTATIONS OF CRUDE RUBBER DURING THE YEAR 1917

January	12,788	August	17,290
February	10,162	September	13,664
March	18,624	October	8,970
April	13,000	November	13,611
May	18,411	December	12,770
June	15,096		
July	12,676	Total for year	167,062

American Rubber Patents

ISSUED JANUARY 1, 1918

1,251,576—To William F. Ray, Chicago, Ill. Tire or Interliner Structure.
1,251,585—To Maximilian C. Schweinert, West Hoboken, and Henry P. Kraft, Ridgewood, N. J.
1,251,717—To Thomas C. Watkins, Ingram, Pa. Vehicle Tire.
1,251,829—To Sherman T. Shults, McCammon, Ida. Tire Inflating Device.

Maple City Rubber Co., Norwalk, Ohio; capital, $20,000; incorporator, M. J. Delaney.

Pilgrim Rubber Footwear Co., Boston, Mass.; capital, $25,000; incorporators: E. R. Chapin, J. Mitchell and G. N. Mead.

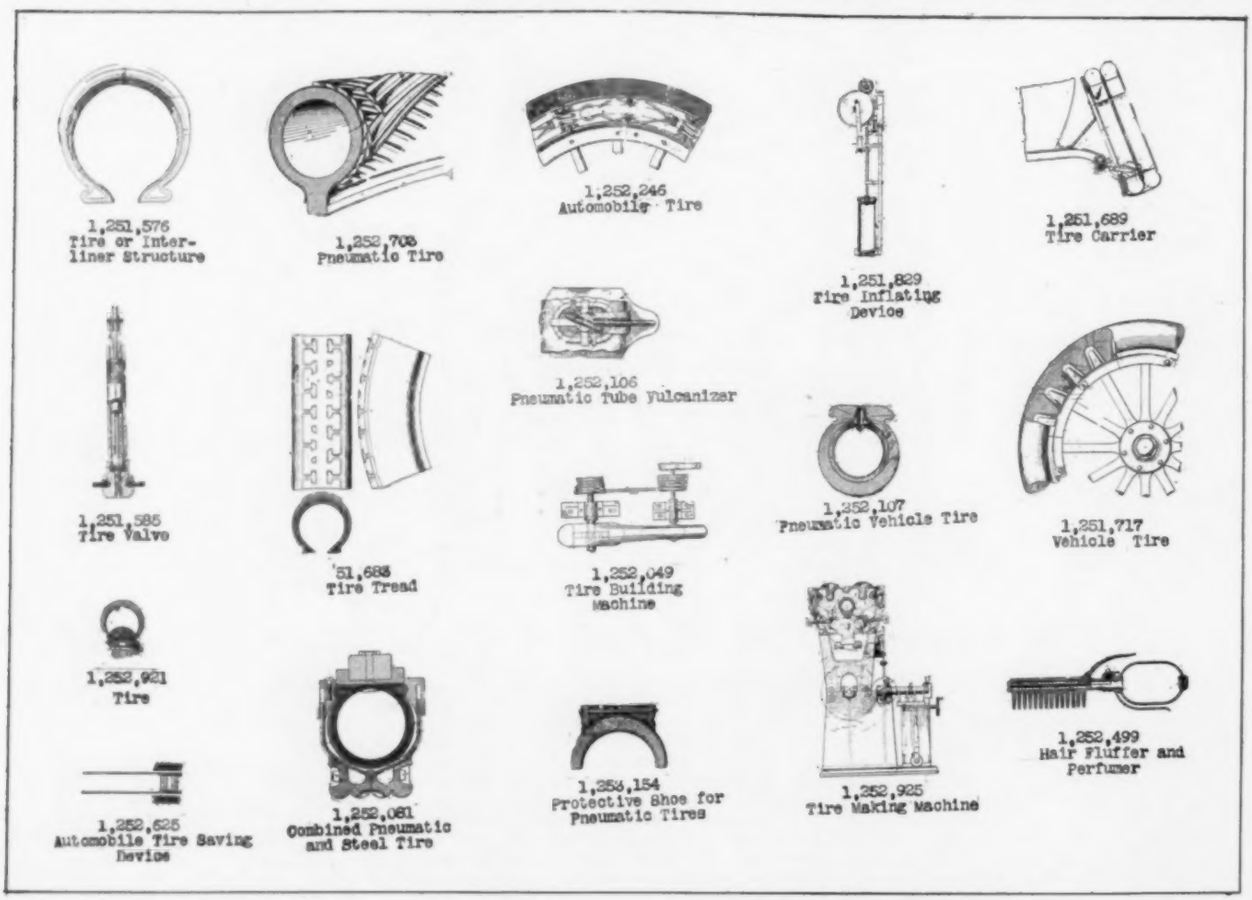
The Adair-Lee Rubber Co., Omaha, Neb.; capital, $25,000; to manufacture tubes, tires and auto supplies; incorporators: Clarence B. Adair, George G. Lee and Abraham B. Lee.

Change of name of Vulcanized Products Co., Chicago, Ill., to Curtis Tire & Rubber Co., and increasing its capital stock from $200,000 to $1,000,000.

shop with free road service. This company will handle Dayton and Diamond tires.

Morse Rubber Co., Inc., 920 Marquette Avenue, Minneapolis, Minn, has taken over the business of Frank L. Morse.

C. H. Flaherty and W. J. Ryan, Spencer, Iowa, have sold the Service Tire & Rubber Co. to W. B. Sweppe and Z. E. Armstrong.



1,251,862—To William W. Carter, Needham, Mass. Rubber Substitute and Process of Making Same.
1,251,863—To William W. Carter, Needham, Mass. Rubber Substitute and Process of Making Same.
1,252,049—To William J. Steinle, Elmhurst Heights, N. Y. Tire Building Machine.
1,252,081—To John Blair, Jr., Rock Springs, Wyo. Combined Pneumatic and Steel Tire.
1,252,106—To Robert Hagen, Dayton, Ohio. Pneumatic Tire Vulcanizer.
1,252,107—To William G. Haigler, Colorado Springs, Colo. Pneumatic Vehicle Tire.
1,252,246—To Herman Dalwigk, San Antonio, Tex. Automobile Tire.
1,251,698—To John G. Perrin, Detroit, Mich. Tire Carrier for Automobiles.

ISSUED JANUARY 8, 1918

1,252,394—To Helen Murray Butler, Milton, Pa. Tire Armor.
1,252,499—To George L. Scheel, Chicago, Ill. Hair Fluffer and Perfumer.
1,252,625—To S. Grant Stannard, Long Beach, Cal. Automobile Tire Saving Device.
1,252,703—To Walter Kline, Lake, Ohio. Pneumatic Tire.
1,252,921—To David Miller, St. Louis, Mo. Tire.
1,252,925—Fredellia H. Moyer, Akron, Ohio. Tire Making Machine.
1,253,154—To John W. Comer, Chickasha, Okla. Protective Shoe for Pneumatic Tires.
51,683—To Dudley Mayo Mason, Kent, Ohio. Tire Tread Design.

New Incorporations

Iron Clad Tire Co., New York; Capital, $10,000; Incorporators: S. A. Paul, D. D. Deutch, J. L. Diamond, of 1789 Broadway, New York.

Standwear Shoe Co., 500 Lombard Street, Baltimore, Md.; capital, $100,000; to manufacture boots, shoes and rubbers, and incorporated to transact business in the state of Illinois; incorporators: Solomon J. Meyersburg of Chicago and Milton J. Hall of Beutah, Md.

The Lancaster Tire & Rubber Co., Columbus, Ohio; capital, $500,000; incorporators: Orr K. Williams, J. Lawrence Porter, Frank J. Macklin, F. A. Miller and E. E. Lerch.

Central Rubber Co., Nyack, N. J.; capital, $200,000; incorporators: P. Leggett, C. Cobb and C. A. Winter.

The Independent Tire Co., Columbus, Ohio, has increased its capital from $10,000 to $50,000.

Among the Tire Dealers

The Motor Accessory & Tire Co., at 905 North Main Street, Pueblo, Colo., has been appointed by the Prest-O-Lite Co. to distribute acetyline gas there.

Malcolm Tire Co., Portland, Ore., has opened a salesroom at 82 Broadway, North, for seconds.

Chesapeake Tire & Rubber Co., Baltimore, Md., has moved to larger quarters at 531 North Howard Street.

Deal Garage, Gainesville, Ga., has installed a vulcanizing plant.

Pinkelman Clarke & Co., Quincy, Ill., has opened a tire sales and vulcanizing

Quick Tire Service, Inc., Kansas City, Kan., has bought the tire service department of the Gustin-Bacon Mfg. Co., and has leased its building at Twenty-seventh Street and McGee Road.

David Danziger and William Gilmore have opened a vulcanizing plant at 1100 Fourth Street, San Rafael, Cal., under the name of Dan's Tire Shop.

G. L. Reichmann has opened a vulcanizing plant and accessory store at 138 South California Street, Stockton, Cal.

Hoelle Rubber Sales Co., San Francisco, Cal., has bought out J. L. Ahlers & Co., 476 Golden Gate Avenue.

Willey Vulcanizing Machine Co., Battle Creek, Mich., will open a $20,000 vulcanizing plant in Dallas, Tex.

Doan Tire & Rubber Co., Wichita, Kan., has opened a pneumatic tire repair shop at 117 N. Emporia Street.

Savage Tire & Supply Co. has opened at 1329 J Street, Sacramento, Cal., where a vulcanizing plant is being installed.

Auto Tire Exchange, Sacramento, Cal., has moved to 1209 J Street.

TIRE NEWS

Hardware Dealers as Tire Distributors

By Clyde S. Thompson

Some things in this world are so self-evident that it seems a waste of time to try to explain them. For instance, take this statement: "a logical outlet for the sale of automobile tires is through hardware jobbers and retail dealers."

Try to argue that if you will. The simple statement that the hardware people are the right people to sell tires opens the debate and closes it too. As a subject for the village debating society it is not merely a "frost"—it's a complete "old-fashioned winter."

The only people I ever heard who criticized the idea of selling tires in hardware stores was a group of advertising solicitors representing a number of automobile trade papers. They couldn't see the idea at all. It happened in Akron. One of the big rubber companies had given a twelve-page order to a hardware paper, and great was the astonishment and indignation of the auto trade paper men thereat. They read the epitaphs of both the sales and advertising managers who were responsible for the outrage. The speedy downfall of both was predicted and it seemed to be the unanimous opinion that they should both be immured in a sanitarium to prevent them from doing further damage.

Of course, this was many, many years ago—almost five years back if I mistake not. Strange to relate, our two heroes are still on the job, and instead of advertising in only one hardware paper they now use them *all*. And many others have followed their lead. In fact the advertising pages of the hardware journals today almost constitute an index of the successful rubber companies.

It is entirely probable that certain hardware stores have sold auto tires ever since the days of the "one lunger" or even since the distant past when we called them "horseless vehicles" and that's same ways back. But if there are such ancient handlers of tires in the hardware trade they are only isolated examples. In the majority of cases the hardware merchant has taken on a line of tires only within the last three or four years.

CLYDE S. THOMPSON
Photo Camera Craft

It seems strange, too, when you try to figure it out. Of all the places where you might think the tire manufacturer would turn for an outlet, the hardware store, to my way of thinking, would be the first choice.

There are a lot of hardware stores in the United States today, 32,000 of them, in fact. That means there is a hardware store in every hamlet, village, town and crossroad, and one in every neighborhood, in the big cities.

In five lines alone these stores did a business in 1917 of about $135,000,000 divided as follows:

Paint and varnish	$52,000,000
House furnishings	42,000,000
Builders' supplies	12,000,000
Mill supplies	22,000,000
Garden hose	6,000,000

It is estimated that the hardware stores sold over $30,000,000 worth of tires and rubber goods in the season just closed. Offhand I would say that a group of merchants who do a volume of business such as indicated by the above figures are a pretty live bunch to tie up to.

Their credit is good, and their financial ratings leave nothing to be desired. For instance there are 19,000 hardware dealers rated as being worth over $3,000 and 15,000 of them are rated as being worth over $5,000.

They're a fine lot of men too, these hardware dealers. Sort of substantial, honest, durable and dependable; they seem to partake of the qualities of the goods they sell. They stand well in the community and few of them find it necessary to cross to the other side of the street when they see the cashier of the bank approaching.

About seven years ago I was present at a sales conference of one of the larger tire companies. The conference started with the usual big feed. Before getting down to the serious business of the evening, and wishing for an excuse to linger over the cigars and cordials, the sales manager called upon an outsider, a guest, for a talk on salesmanship. This man had had a wide experience in the sales field and knew whereof he spoke. He prefaced his remarks by saying that "up to that time tires had been *bought* and not *sold*." Right then and there he spoiled a

perfectly good evening for a large number of alleged tire salesmen. Up to that time they had harbored the thought that they were regular salesmen. Didn't they know all about the construction of tires; and call every garageman by his front name; didn't they carry a sample case and one and all turn in healthy expense accounts each week? Of course they did, and incidentally they received a lot of orders of their particular brand of tires from the car dealers and garage men.

But the outsider was telling them the cold bitter truth, though it was not recognized as such at the time. But a few years ago the supply of tires was not up to the demand. There were comparatively few tire manufacturers and no real intensive sales methods were required to dispose of the output. But what a big difference just a few years has made. Today there are a score of tire factories for each one of a few years since, and while, of course, the demand for tires has grown with each succeeding season, tire production has more than kept pace. In fact the tires are way ahead of the cars—and going strong. More tires are being made than are being sold. The huge profits of the rare old days have given way to a normal profit, and in consequence tires today must be *sold*. And it takes real salesmen and real sales managers to do the job.

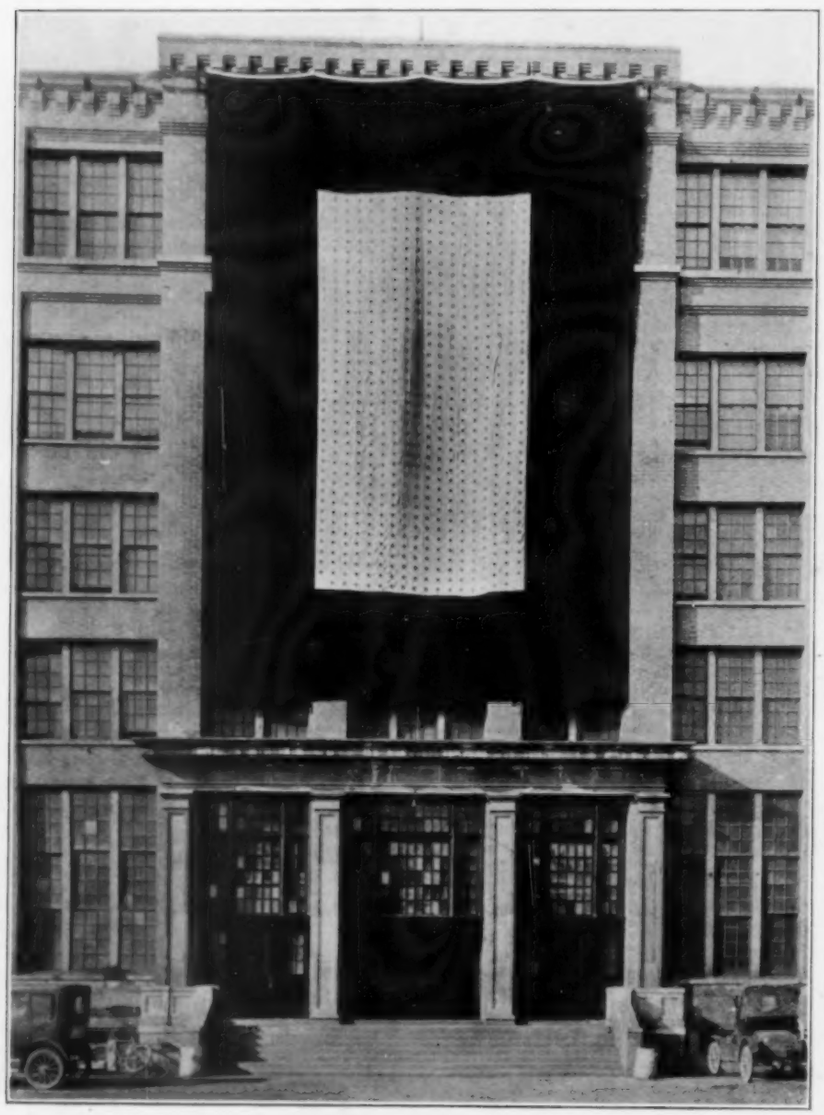
It was this spur of necessity—the competition that made it necessary to *sell* tires—that caused tire salesmen to belatedly discover the possibilities of the hardware store. The hardware store has been right there on the same spot for years—didn't need to be discovered! It was there before most of the tire companies were started, and it has always been a logical place to do business in automobile tires.

It would seem that a hardware store, once established, is permanent. I believe I've seen every kind of business (from bird stores to shooting galleries) pack up and flit to other locations. But for the life of me I can't remember ever having seen a moving van backed up in front of a hardware store except for the purpose of buying goods. Like the well advertised and favorably known Rock of Gibraltar, the hardware store stays put in one spot.

Seriously speaking though, from every angle and from every consideration, the hardware store is a logical place to sell tires. That the tire manufacturers are awake to this fact is evidenced by the rapidly increasing amount of business they are building up each season through the hardware channel. The tire manufacturer, by disposing his product to a limited number of hardware jobbers saves a big item by the elimination of sales expense. On the other hand the jobber, having a large traveling sales organization is not put to any additional expense: his regular organization can, and usually does, suffice to sell a huge volume of tires. The result is a profitable business conducted at the minimum of selling expense.

Of course the tire business is not all " beer and skittles " even for the hardwarist. " Pigs is pigs," " hardware is hardware," but " tires is troubles." The subject of " adjustments " has strained the temper of more than one hardware man. It will continue to be an irritating and bothersome subject as long as tires are sold on a mileage basis. Some future Solomon has his work all cut out for him in settling the adjustment problem.

Some man once said that a dog *must* have fleas—otherwise he wouldn't know he was a dog. By the same reasoning the adjustment problem may be a necessary evil so that men will appreciate that they are in the tire business.



FIRESTONE SERVICE FLAG DISPLAYED OVER MAIN FACTORY ENTRANCE AT AKRON

Run Busses on Railroad Tracks

As a result of the bad weather, the Goodyear Tire & Rubber Co., Akron, Ohio, found that the highways between the factory and the balloon field, about ten miles, were impassable for motor transportation. The wheels were removed from the regular busses, and replaced with flanged steel wheels. Permission was obtained from the A. C. & Y. and Wheeling & Lake Erie Railroads to run the busses over their lines, which lead to the field, and in this manner transportation was maintained while the highways were blocked.

News of the Tire Trade

Success of Army Motor Transport—Converse Modifies Tire Tread—General Reorganizes Sales Force—Truck Designs Completed

Success of Army Motor Transport

The transportation of a train of thirty loaded army transport motor trucks, under their own power, from Detroit to the seaboard, marks a new epoch in military transport in this country. This fleet consisted of Packard trucks on Goodyear solid tires, and left Detroit in charge of Company No. 2, Division Supply Train No. 308, in the midst of a snowstorm which brought a very heavy fall throughout the entire North. After an eight days' battle with the snow, in places drifted almost as high as the trucks, the train reached Pittsburgh, where the Lincoln highway was met and followed. All the trucks were equipped with solid tires. The train was divided into three units of ten trucks each, with a sergeant in charge of each unit. The trucks were driven by the soldiers, with two men assigned to each one. Included in the train were two 250-gal. tankers, which supply the gasoline and oil wants of the trucks, and a kitchen truck to provide emergency meals en route.

This is the pioneer effort of the National Council of Defense to move military equipment from the Central West to the Eastern seaboard by motor truck. Each truck carried a load of military supplies for our armies in France.

The expedition was joined at Warren, Ohio, by one of the Akron-Boston trucks of the Goodyear Tire & Rubber Co., fitted with the necessary equipment to assist the trucks over the steep grades and to render practical assistance in getting the trucks back on the road after bad skids.

Thousands of motor trucks must be brought to the eastern seaboard for shipment to our forces in France, and it is likely that before long the presence of motor truck trains on our highways will become common-place. The difficulties encountered in moving this train of thirty trucks—an infinitesimal part of the thousands that the Government must have—emphasize graphically the great need of improved highways.

Polack Changes

T. J. Manning, for 15 years with the Gibney Tire & Rubber Co., as manager of their solid-tire business in Philadelphia, has been appointed manager of the Polack Tyre & Rubber Co.'s Philadelphia branch. He is one of the oldest men in the business.

H. E. Heyder, who for some years has been manager of the company's Brooklyn branch, has been promoted to manager of Western factory sales with headquarters in Detroit, Mich.

On the first of the new year the company opened a new branch at Buffalo, with service station at 1474 Main street, and have secured George M. Kraus as Buffalo branch manager. Mr. Kraus for a number of years was connected with the Atterbury Motor Truck Co., as purchasing agent.

Newark Auto Show February 19-26

The Newark Automobile Show will be held in the First Regiment Armory of that city from February 19 to 26. Claude E. Holgate, 22 Washington place, Newark, is the manager, and states that applications for space closed January 24. The exhibit of motor trucks and commercial vehicles will be a big feature, and a greater amount of space will be allotted to these cars than ever before.

Converse Modifies Tire Tread

The Converse Rubber Shoe Co., Malden, Mass., announces a rearrangement of the tread design of its non-skid automobile

THE NEW CONVERSE TREAD

tire. The Converse tread consisted of two parallel row of clover leaf vacuum cups, arranged in a manner that placed the cups of each row exactly opposite those of the other row.

In the rearrangement the basic design of the tread has been retained, but the

THE OLD CONVERSE TREAD

clover leaves, instead of being opposite each other, are staggered.

The rearrangement, which became effective Jan. 1, 1918, was adopted after a long series of road tests which showed that the staggered arrangement intensified the anti-skid properties of the tire and results in a far better distribution of road stresses. The accompanying photographs show the old and the new lay-out.

General Reorganizes Sales Force

The General Tire & Rubber Co., Akron, Ohio, announces the reorganization of its sales department covering tire accessories and repair materials. This department is now under the management of H. G. Ault, who was previously connected with the Firestone Tire & Rubber Co., Akron, Ohio, in a somewhat similar capacity and has a wide acquaintance with the jobbing trade as well as the regular tire dealers and tire repair men.

The General Tire & Rubber Co., has specialized on tire accessories, and in line with their policy to retain leadership in developing new helps for tire owners, this company expects to be able in the near future to announce new tire accessories and repair materials to the trade.

Truck Designs Completed

Completion of designs for standardizing all the motor trucks and trailers needed by the Government for peace as well as war work is announced by the Quartermaster Corps. Three classes of trucks have been provided, of which the class AA with three-fourths ton capacity was the last to be worked out by the 200 automobile engineers who have contributed many new ideas. Manufacture of the class B trucks, having a rated capacity of three tons, already has started after exhaustive tests of the sample cars. Three sample trucks of the class A variety now are being tested. Plans for standard model trailers include one of three tons capacity requested by General Pershing for early use in France. It will have only two wheels according to present designs.

Goodyear Branch Destroyed

The branch building of the Goodyear Tire & Rubber Co., at Hartford, Conn., recently burned with total loss of stock and building. While the firemen were battling with the flames arrangements were already being made by the branch manager for a new location to open up for business the next morning. A stock of Goodyear products was requisitioned from another New England branch. These prompt measures resulted in the continuance of the business of the office without the loss of a single hour, and the wants of the motorists of that region were supplied without interruption.

Tires in Akron

(Special Akron Correspondence.)

The atmosphere of Akron has become so impregnated with the rubber business that even the trees are sprouting tires.

At least that was the first impression made on visitors to the Rubber City, when going down one of its busy streets recently.

A clever young man had opened a new tire repair shop, and to advertise his business, had decorated the branches of a tree with tires of all makes and sizes.

Test of U. S. Royal Cord Tire

Reports of an interesting test of a cord tire made by the United States Rubber Co. come from California. A motor stage, operating between San Pedro and Redondo, and equipped with U. S. Royal Cord tires, ran 28,411 miles. Then the tires were retreaded, and a total of 38,249 miles was attained.

Kalamazoo Automobile Show

The annual automobile show of the dealers association, Kalamazoo, Mich., will be held in the armory, February 5-9, inclusive. To date twenty-two exhibitors have engaged space for cars and accessories, and in addition there will be several truck exhibits.

Classified Buyers' Index To Rubber Factory Equipment

Below is printed an alphabetical list of the principal machinery and other equipment used in rubber factories, compiled from information supplied by the manufacturers. The key symbols placed after the items refer to the names of the manufacturers that make them, as shown in the list of Manufacturers of Rubber Factory Equipment, that is printed elsewhere on this page.

Accumulators, A11, B23, F3, T31, W31.
Autoclaves, A11, B31, D15, E11, S55.
Balances, B7, E11, S19, T27.
Bins, Stock, O3.
Blocks, Pillow, A11, F3, T43.
Blowers, Tube Splicing, G3.
Boilers, Steam, S31.
Boosters and Exhausters, A3.
Boxes, Compound, O3.
Brands, Aluminum, D19.
Brakes, T43.
Brushes, O7.
Buckets, D27.

Cages, D27.
Calenders, A11, F3, S31, T43.
Calenders, Embossing, F3, H11, T19, T43.
Cars, Shoe, O3.
Carton Filling Machines, W23.
Carton Making Machines, W23.
Castings, A11, B3, B23, B31, D27, F3, M3, T31, T43, W31.
Chemical Apparatus, B31.
Chucks, S47.
Clutches, Brake, F3, T43.
Clutches, Friction, F3.
Clutches, Magnetic, F3, T43.
Compressors, Air, S31, T31.
Condensers, D15, S55, T31.
Conveyors, D27.
Cores, Tire, A11, B3, T31, J3.
Couplings, Power, T43.
Crackers, A11, F3, T43.
Cranes, D27.
Cutters, Baby Carriage Tire, W23.
Cutters, Band, A11, E3, H31, R7.
Cutters, Bias, W23.
Cutters, Duck Plug, W23.
Cutters, Gaskets, A11, H11, H31.
Cutters, Raw Stock, W23.
Cutters, Rubber Stock, H19, H31, R7, T11.
Cutters, Scrap, A3, T11.
Cutters, Strip, E3, F3.
Cutters, Tubing, W23.

Devulcanizers, B11, D15.
Dies, A11, D19, H11, D19.
Die Sinking, A11, D19, H11.
Dies, Cutting, D19, H11.
Digestors, D15.
Dipping Machines, O3.
Doubling Machines, F3, T43.
Doubling Machines, Fabric, T17.
Drills, D27.
Drives, A11, D27, F3, T43.
Drives, Chain, D27, F3, T43.
Drives, Motor, A11, D27, F3, T43.
Drums, Bead, A11, T31.
Drums, Tire Machine, G3.
Drums, Tread, A11.
Dryers, A35, B31, D15, H27, S31, S55.
Dryers, Fabric, C51, D15, T19, T43.
Dryers, Rubber, D15.
Dryers, Vacuum, D15, S55.
Dynamometers, S19.

Engines, Steam, S31.
Engraving Machines, Hard Rubber, A11.
Experimental Outfits, A11, B3, D15, D19, E11, F3, T43.
Extractors, E11.

Fittings, Hydraulic, A11, B23.
Fittings, Water, A11.
Folders, Belt, F3.
Forms, Dipping, D19.

Gages, Pressure, B23, S7.
Gages, Recording, S7.
Gages, Thickness, H11.
Gears, A11, F3, M23, T43.
Governors, Pump, M15.
Grinders, A11, F3, S47, T43.
Grinders, Hard Rubber Dust, A3, A11, F3, R3, T43.

Hammers, Steam, B31.
Hangars, D27, M27.
Hoists, D27.
Holders, Form, O3.
Hooks, Tire, D27.
Hose Machines, F3, R27.
Hydraulic Machinery, A11, B23, F3, H19, T43, W31.
Hydrometers, T7, T27.
Ice Machines and Equipment, D27.
Impregnators, B31, D15, F3, S55.
Instruments, Recording, S7, S19.
Insulating Machines, R27.
Joints, Expansion, A11, B23.
Kettles, A11, B31, D7, D15, S31, S55.
Knives, H31, J7, R7, T43.
Knives, Calender, R7.
Knives, Jar Ring, R7.
Knives, Mill, R7.
Knives, Tapping, R7.

Laboratory Apparatus, D7, D15, E11, F3, R27, S15, S19, T27.
Ladders, Rolling, M27.
Lathes, Hard Rubber, A11, S47.
Lathes, Jar Ring, A11, T31, W23.
Lathes, Wrapping, A11.
Lockers, O3.
Looms, Hose, R27.

Magnets, D23.
Mandrels, A11.
Markers, Shoe, H11.
Microscopes, E11, T27.
Mills, Grinding, A3, A11, E11, F3, R3, D7, T43.
Mills, Mixing, A11, D7, F3, T43, W7.
Mills, Paint, D7, R3.
Mills, Washing, A11, F3, T43, W7.
Mixers, Solution, D7, W7.
Molds, Hose, A11.
Molds, Mechanical, A11, D19, H11, H19, M3, T15, J3, D19.
Molds, Sole and Heel, D19, J3, D19.
Molds, Sundries, D19, H11, J3, D19.
Molds, Syringe Bag, D19, J3, D19.
Molds, Tire, A11, B3, T31, J3, D19.
Molds, Toy, D19, J3, D19.
Molds, Water Bottle, D19, J3, D19.
Motors, D27, E11, T43.
Name Plates, H11.

Pattern Making, A11, M3, T43.
Percolators, D7, D15, E11, S55.
Plaiters, W23.
Plantation Machinery, F3, T43.
Plants, Aniline Oil, D15.
Presses, Baling, B23.
Presses, Bead, A11, B23, F3, W31.
Presses, Belting, A11, B23, F3, T43, W31.
Presses, Blocking, B23.
Presses, Filter, A3.
Presses, Forcing, A11, B23, T43, W31.
Presses, Hand, A11, B23, E11, F3, H19.
Presses, Heater, A11, B11, F3, W31.
Presses, Hydraulic, A11, B23, F3, H19, T19, T31, T43, W31.
Presses, Plate, A11, B23, F3, W31.
Presses, Sheeting, A11, B23, F3.
Presses, Shoddy, A35.
Presses, Tire Setting, A11, B23, W31.
Presses, Vulcanizing, A11, B11, B23, F3, T31, W31.
Pulverizers, A3, D7, E11, R3.
Pumps, A3, A11, E11, M27, S31, T31.
Pumps, Centrifugal, T31, W31.
Pumps, Hydraulic Pressure, A11, B23, S31, T31.
Pumps, Spray, M27.
Pumps, Vacuum, A3, B31, D15, E11, S31, S55, T31.

Racks, Drying, D7, D27.
Racks, Shoe Car, H11, O3.
Racks, Tire, D7, D27, O3.
Railways, Industrial, D27.
Reclaiming Machinery, B11, D7, F3, R27, S55, T43.
Refiners, A11, F3, T43.
Regulators, Damper, M15.
Regulators, Pressure, D3, M15, T7.
Regulators, Pump, M15.
Repair Equipment, Tire, B11.
Riveters, W31.
Rollers, Hand, B3, H11, H19.
Rollers, Strip, B3.
Rolls, A11, F3, T43.
Rolls, Chilled, A11, T43.
Rolls, Cooler, F3.
Rolls, Engraved, F3, H11.
Rolls, Mill, A11, F3, T43.
Rolls, Sand, A11, F3, T43.
Rolls, Steel, F3.
Rolls, Wood, G3.
Safety Appliances, D27, F3.
Scales, B7, D27.
Screens, D7, O3.
Screw-Downs, Calender, A11, T43.
Separators, Air, R3.
Separators, Magnetic, D23.
Separators, Water, A35.
Shafting, A11, D27, F3, T43.
Shears, Hand, J7.
Shears, Power, F3.
Shells, Belting, G3, C55.
Shells, Calender, C55, O3
Shells, Stock, G3, C55.
Sifters, D7.
Sifters, Brush, D7.
Slitting Machines, F3.
Skivers, J7, R7.
Solvent Recovery Apparatus, B31, D15, S55.
Special Machinery, J3.
Spreaders, A11, F3, T43.
Sprockets, D27, M23, T43.
Stamps, Steel, D19, H11, D19.
Stands, Tire, A11, B3, T31.
Starters, Motor, T43.
Sticks, Shoe, H11, O3.
Stitchers, B3, H11.
Stops, Safety, D3, D27, F3, T43.
Strainers, A11, R27.
Stretchers, Belt, A11, F3, T19, T43.
Stretchers, Hydraulic, A11, F3, T43.
Switches, Electrical, D27, T43.

Tables, Calender, O3.
Tables, Cooling, D27, O3.
Tables, Tire Conveying, O3.
Tanks, Acid, B11, D15, S55, T19.
Tanks, Soaking, B11, S55, T31.
Testing Machines, B11, S19.
Thermometers, E11, S7, T7, T27.
Tire Making Machines, B3, R27, T31.
Tire Tread Machines, R27.
Tire Wrapping Machines, Cloth, T15, T31, T43.
Tools, Fountain Pen, S47.
Tools, Rubber Workers', H11, H31.
Tramways, Overhead, D27, O3.
Transmissions, A11, D27, M23, T43.
Traps, Steam, D3.
Trimmers, W23.
Trolleys, D27.
Trucks, Industrial, D7, D27.
Tube Wrapping Machines, A11, T43.
Tubing Machines, A11, R27.

Valves, Float, M15.
Valves, Hydraulic, B23, D27, T31, W31.
Valves, Reducing, D3, D27, M15.
Vulcanizers, A11, B11, D15, T31, W31.

Washers, A11, D15, F3, T43.
Washers, Beater, T43.
Washers, Tub, D7, F3, T43.
Wheels, Buffing, O7.
Wheels, Roller Bearing, D27.
Wire Drawing Machines, T43.
Wiring Machine, Hose, A11.
Wrapping Machines, A11, T15, T31.

Manufacturers of Rubber Factory Equipment

THE RUBBER AGE AND TIRE NEWS will gladly supply information regarding the addresses and products of the following manufacturers of Rubber Factory Equipment.

The advertisements of concerns whose names appear in bold face type will be found in this issue of THE RUBBER AGE AND TIRE NEWS.

A 3—Abbe Engineering Co.
A 7—Adams, John J.
A 11—Adamson Machine Co.
A 15—Adamson Mfg. Co.
A 19—Air Utilities Co., Inc.
A 23—Akron Rubber Mold & Machine Co.
A 27—Allen Machinery Co.
A 31—Alvey-Ferguson Co.
A 35—American Process Co.
A 39—American Rotary Valve Co.
A 43—American Tool & Machine Co.
A 47—Arthur Vulvanizing Machine Co.
B 2—Banner Machinery Co.
B 7—Becker, Christian, Inc.
B 11—Biggs Boiler Works Co. See Advertisement on Page 415.
B 15—Birmingham Iron Foundry.
B 19—Bonnett Co.
B 23—Boomer and Boschert Press Co. See Advertisement on Page 408.
B 27—Bristol Co.
B 31—Buffalo Foundry & Machine Co.
C 3—Cameron Machine Co.
C 7—Cell Drier Machine Co.
C 11—Champion Shoe Machine Co.
C 15—Chernack Mfg. Co.
C 19—Chicago Mold & Machinery Co.
C 23—Edred W. Clark.
C 27—Colonial Sign & Insulator Co.
C 31—Continental Rubber Works.
C 35—Cox, Geo. P., Last Co.
C 39—Crane Co.
C 43—Curtis & Marble Machine Co.
C 47—Cutler-Hammer Clutch Co.
C 51—Cutter, G. A., Sales Agent.
C 55—Cylinder Mfg. Co.
D 3—Davis, G. M., Regulator Co.
D 7—Day, J. H., Co.
D 11—De Mattia Bros.
D 15—Devine, J. P., Co.
D 19—Die Sinking & Machine Co.
D 23—Dings Magnetic Separator Co.
D 27—Duncan, J., Co.
E 3—Eastman Machine Co.
E 7—Eggers, William, & Sons.
E 11—Elmer & Amend.
E 15—Esterline Co.
F 3—Farrel Foundry & Machine Co. See Advertisement on Page 363.
F 7—Ford Chain Block & Mfg. Co.
G 3—Gammeter, W. F. See Advertisement on Page 413.
G 7—Garvin Machine Co.
G 11—General Electric Co.
G 15—Goodnow, L. H., Foundry Co.
H 3—Hartford Special Machinery Co.
H 7—Haywood Tire & Equipment Co.
H 11—Hoggson & Pettis Mfg. Co. See Advertisement on Page 409.
H 15—Hollander & Johnson.
H 19—Holmes Bros.
H 23—Housatonic Machine & Tool Co. See Advertisement on Page 414.
H 27—Hunter Dry Kiln Co. See Advertisement on Page 409.
H 31—Hyde Manufacturing Co. See Advertisement on Page 409.
J 3—Jones & Kuhlke. See Advertisement on Page 414.
J 7—Judson Cutlery Co.
K 3—Knott, L. E., Apparatus Co.
K 7—Kohl Mfg. Co.
L 3—Lander Last Co.
L 7—Landis Machine Co.
L 11—Lenz & Naumann.
L 15—Link Belt Co.
L 19—Lloyd, John, Co.
L 23—Lobdell Car Wheel Co.

Manufacturers of Rubber Factory Equipment—Continued

M 3—McFarland Foundry & Machine Co.
M 7—McGrory, Philip.
M 11—Mahlow & Wykoff.
M 15—Mason Regulator Co.
M 19—Miller, Chas. E.
M 23—Morse Chain Co.
M 27—Myers, F. E., & Bro.
N 3—New England Butt Co.
N 7—Norton, M., & Co.
O 3—Ornamental Iron Works Co.
O 7—Osborn Mfg. Co.
P 3—Pierce Wrapping Machine Co.
R 3—Raymond Bros., Impact Pulverizer Co.
R 7—Richard Co., Inc., Stephen.
R 11—Riehle Bros., Testing Machine Co.
R 19—Ross, Charles, & Son Co.
R 23—Rossman, Roy G.
R 27—Royle, John, & Son.
S 3—Sargent, E. E., & Co.
S 7—Schaefer & Budenberg Mfg. Co.
S 11—Schuchardt & Schutte.
S 15—Scientific Materials Co.
S 19—Scott, Henry L., & Co.
S 23—Sessions, J. H., & Sons.
S 27—Shaler, G. A.
S 31—Shartle Machine Co.
S 35—Shoe Hardware Co.
S 39—Singer Sewing Machine Co.
S 43—Smith-Backmann Machine Co.
S 47—Smith Co., James M.
S 51—Southwark Foundry & Machine Co.
S 55—Stokes, F. J., Machine Co.
S 59—Summit China Co.
T 3—Tagliabue Mfg. Co.
T 7—Taylor Instrument Co.
T 11—Taylor, Stiles & Co.
T 15—Terkelsen & Wennberg.
T 19—Textile Finishing Machine Co. See Advertisement on Page 412.
T 23—Textile Machine Co.
T 27—Thomas Co., Arthur H.
T 31—Thropp's, John E., Sons Co.
T 35—Trefethen, F. L.
T 39—Troemner, Henry.
T 43—Turner, Vaughn & Taylor Co. See Advertisement on Page 416.
U 3—Utility Mfg. Co.
V 3—Venn, Frank.
W 7—Werner & Pfleiderer Co.
W 11—Westinghouse Electric Mfg. Co.
W 15—Williams Foundry & Machine Co.
W 19—Williams Patent Crusher & Pulverizer Co.
W 23—Wills, Arthur J.
W 27—Wolff Co.
W 31—Wood, R. D., & Co.
W 35—Work, Joseph W.

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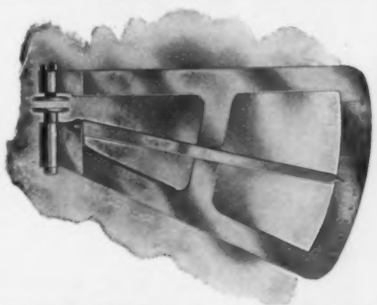

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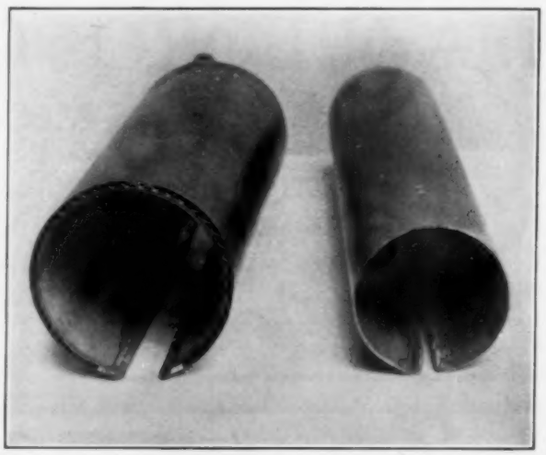

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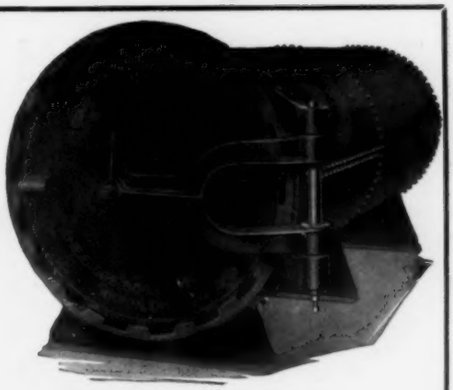

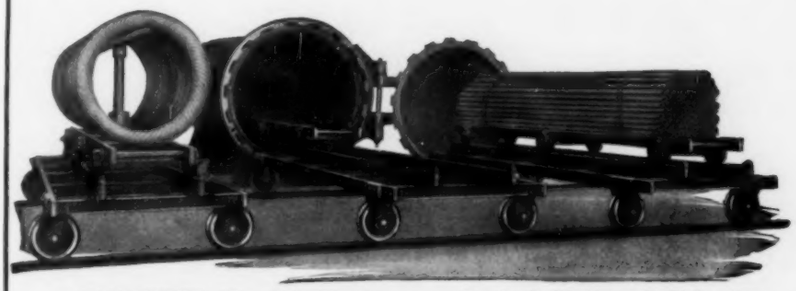

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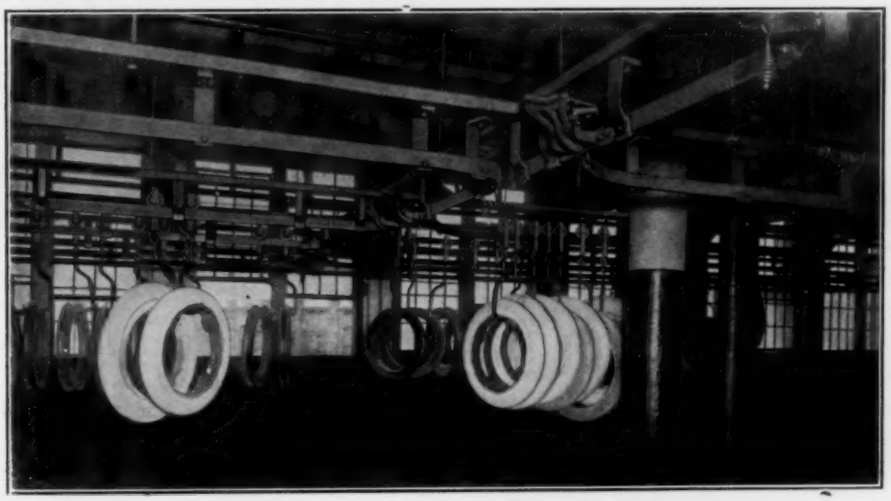

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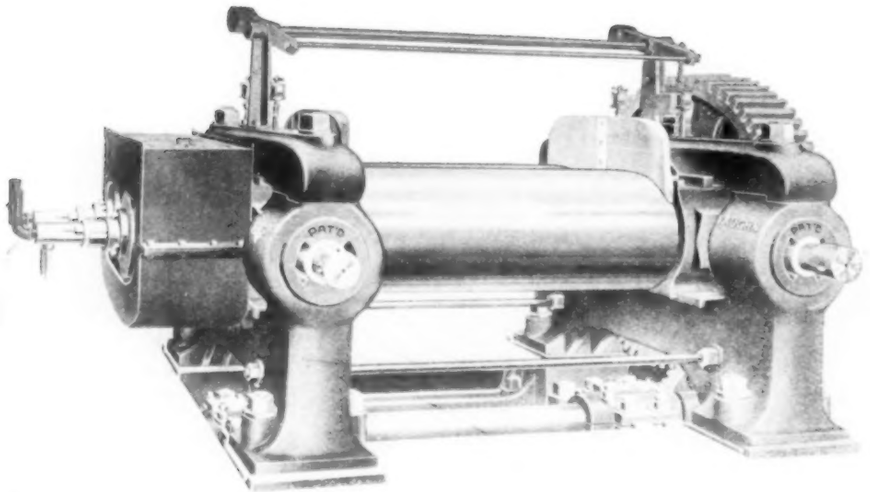

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